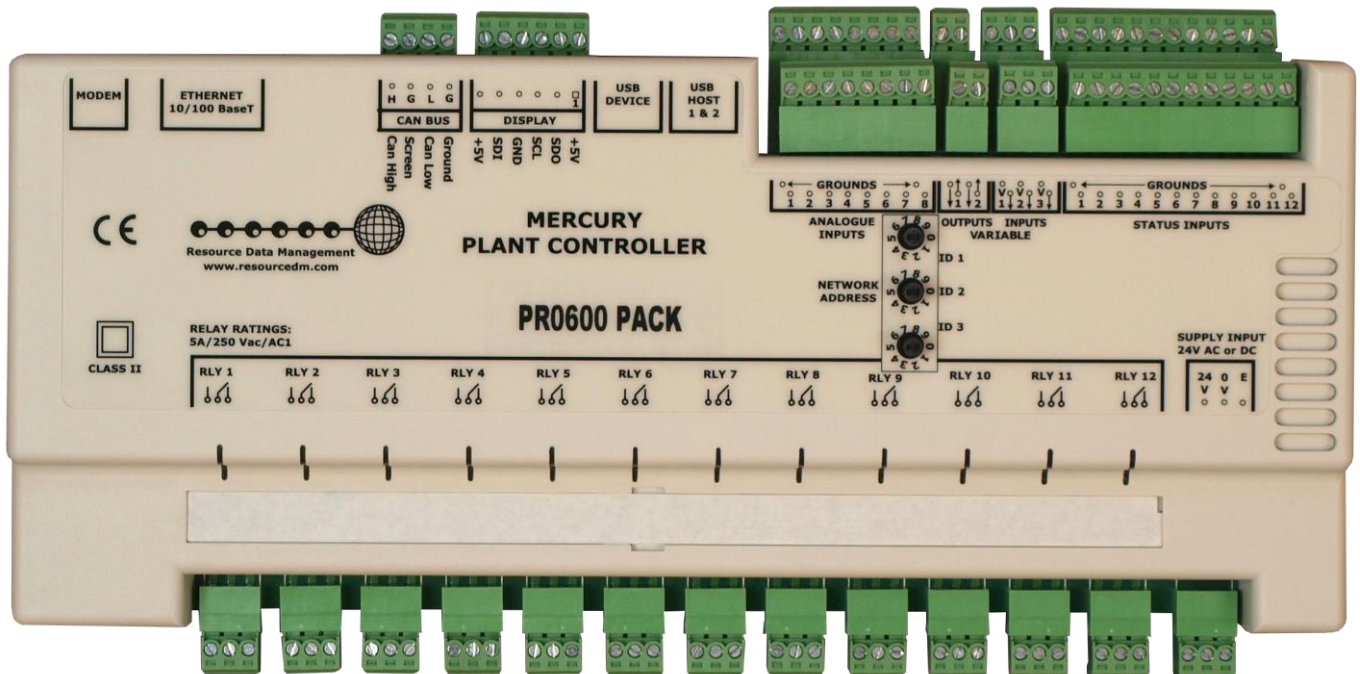


Mercury Plant - Pack Controller Installation & User Guide

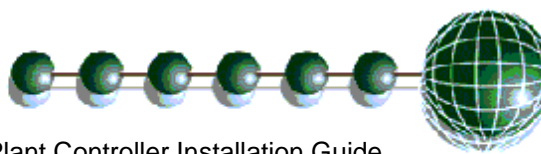


Product Number: -

PR0600
PSU: - PR0625



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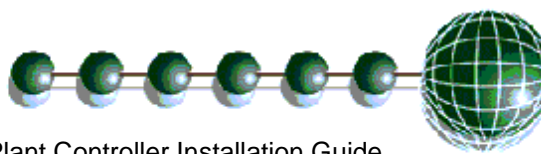


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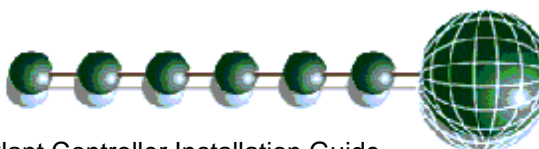


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The Mercury Range

From Resource Data Management

This documentation refers to the controller Mercury Plant Controller

Description

The Mercury Plant Controller is a versatile controller intended for Pack and/or Condenser control. It has 12 relay outputs that are configurable for compressors, loaders, trim compressors or fans. The 12 digital inputs can be assigned for Pack or Condenser section inputs or general alarms. There are three inputs for pressure transducers (either can be set to 4-20mA, 0-5Vdc or 0-10Vdc); 2 for control purposes and 1 monitor. The Pressure readings obtained from the three inputs can be broadcast over a Data Manager IP network for use by RDM Mercury Switch (PR0018-PHI). There are 8 temperature probe inputs. The controller has 2 analogue outputs to control variable speed devices (either can be set to 0-5V dc, 0-10V dc, 4-20mA or 0-20mA). The controller has 10 software type options, see table below.

The "Fuzzy" based algorithm, will give enhanced control whilst maintaining the starts/hr requirement. The algorithm also reduces the number of input parameters required for control; only a target pressure is needed. The "staged" type allows the user to fully program the output stages to the desired elements.

The Mercury Plant controller has an embedded Ethernet port to allow for connection to a Data Manager system without the need for a communications module. A USB port allows for a direct PC connection.

All relays are volt-free and can be mixed between low and high voltage sources. The controller requires a 24Vac or 24Vdc PSU (Vdc PSU available from RDM: - PR0625)

Configuration

The controller has ten configuration options: -

Types

Display value	Type	Control Type
1	Pack	Fuzzy
2	Dual Pack	Fuzzy
3	Pack/Condenser	Fuzzy
4	Dual Condenser	Fuzzy
5	Condenser	Fuzzy
6	Pack	Staged
7	Dual Pack	Staged
8	Pack/Condenser	Staged
9	Dual Condenser	Staged
10	Condenser	Staged

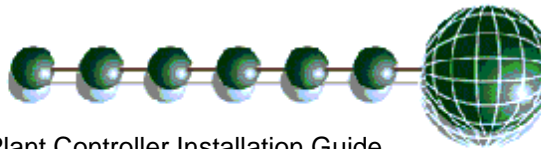
The controller is delivered pre-configured as a Pack Controller (Type 1) See [Type Change](#)

A PC program is available to pre-configure the Pack controller for downloading into the Plant hardware. Contact RDM for further details.

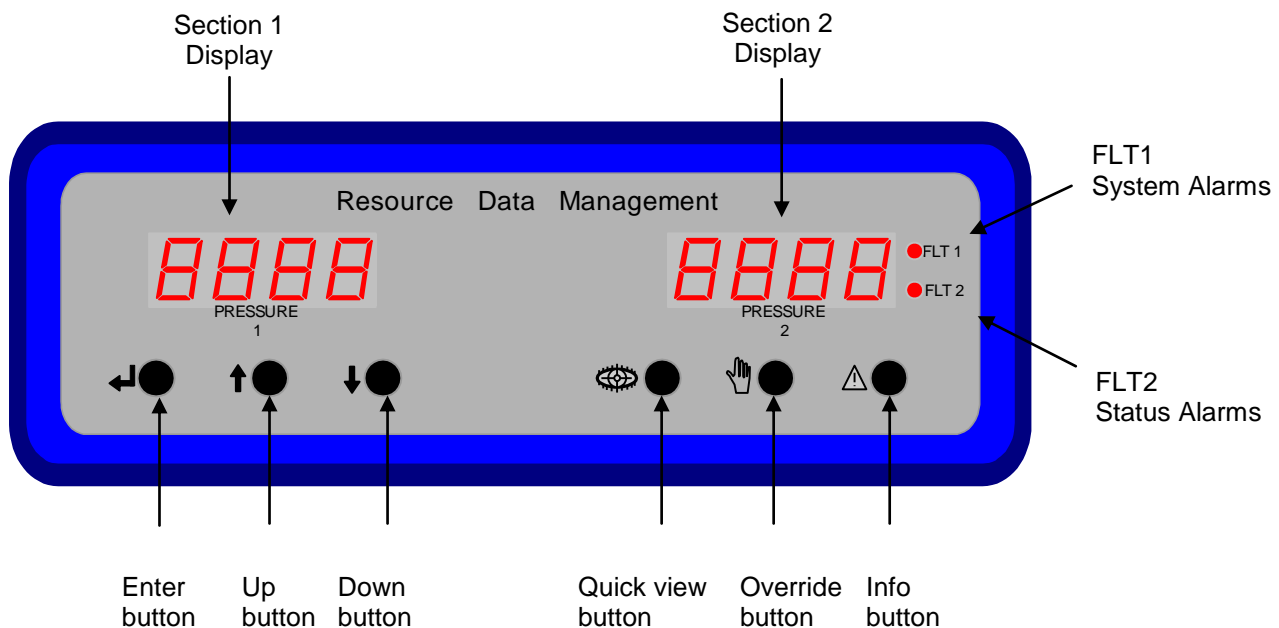
See [Set-up](#) to change the controller type.



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Front Panel: -



Section 1 Display

4 character display, shows the pressure (suction for pack, discharge for condensers)
In set-up mode, displays the set-up menu items
In quick view mode, indicates the target pressure
In Override mode, indicates and allows the relays to be forced on

Section 2 Display

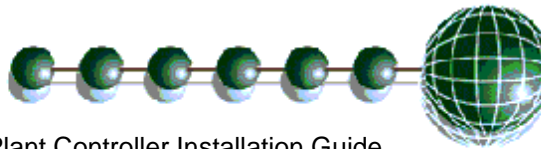
4 character display, shows the pressure (suction for pack, discharge for condensers)
In set-up mode, display is blank
In Override mode, display is blank

Front Panel Buttons

- Enter Button: -** Used to enter menu items.
- Up Button: -** Used to scroll up
- Down Button: -** Used to scroll down
- Quick View Button: -** Used to view the target pressure (See [Quickview](#) section)
- Override Button: -** Used with the "Enter" button, to go into the override mode. (See [Override](#) section)
- Info Button: -** Used to view the current analogue outputs values. (See [Info](#) section)

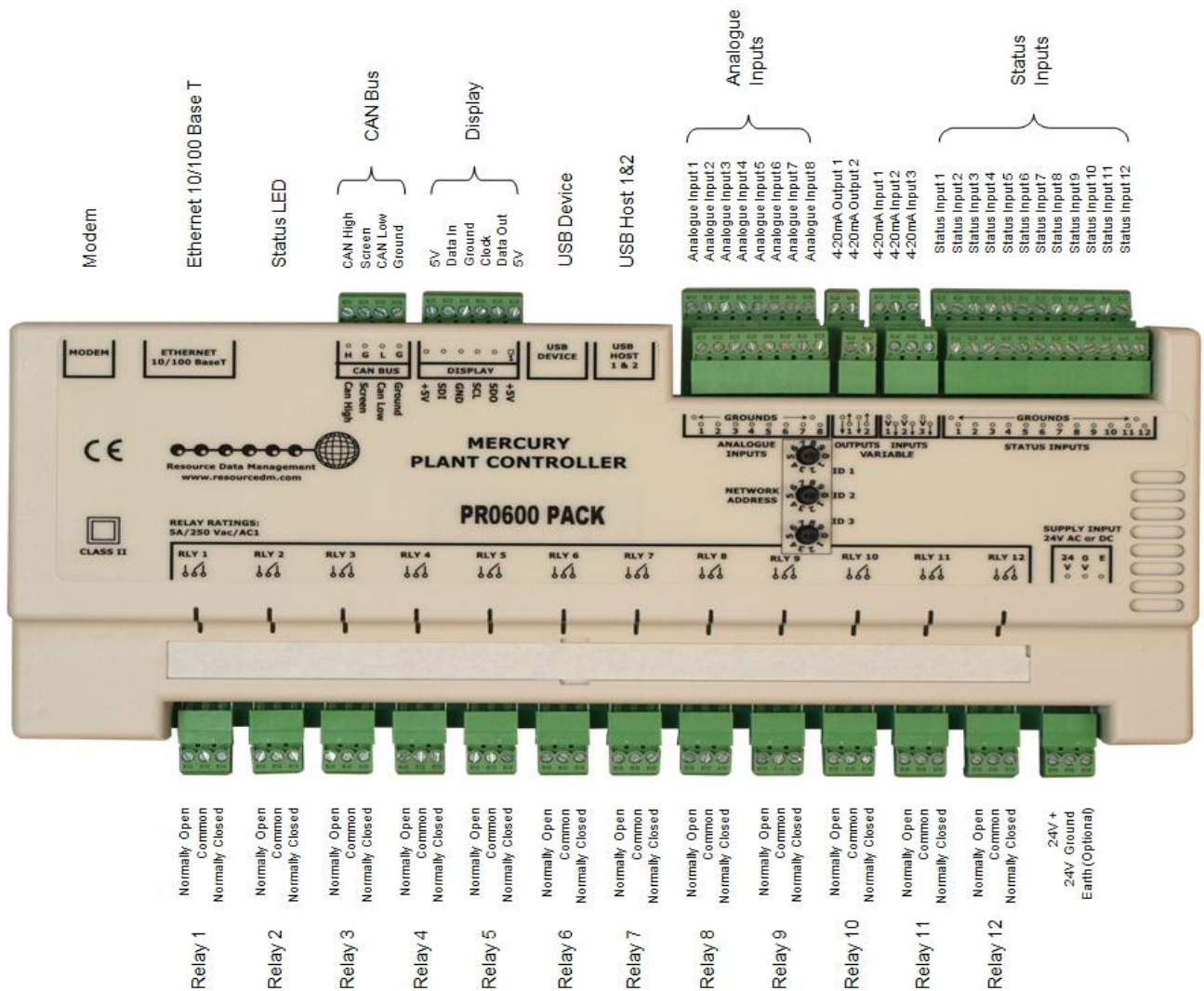


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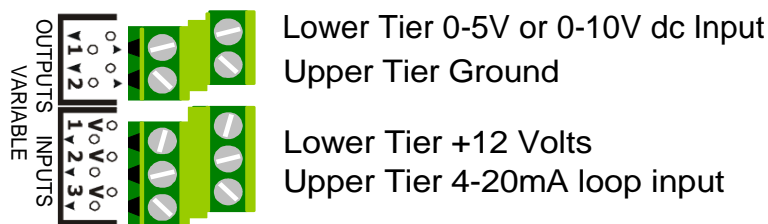


Mercury Plant Controller Installation Guide

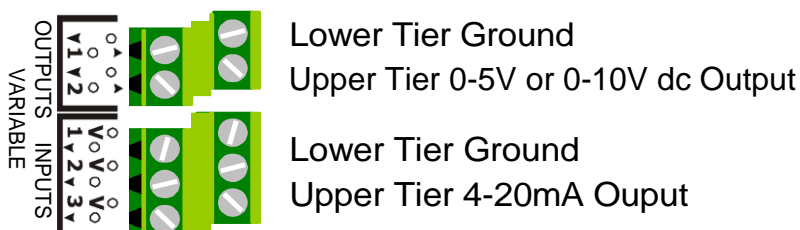
Plant Controller I/O Connections



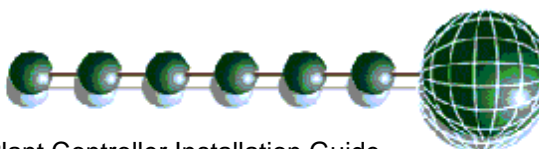
Variable Analogue Inputs



Variable Analogue Outputs



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Mercury Plant Controller Installation Guide

Input/s & Outputs

All Types	Description	Comments
Digital Input 1	0V return or 24 Vac	Note 1
Digital Input 2	0V return or 24 Vac	
Digital Input 3	0V return or 24 Vac	
Digital Input 4	0V return or 24 Vac	
Digital Input 5	0V return or 24 Vac	
Digital Input 6	0V return or 24 Vac	
Digital Input 7	0V return or 24 Vac	
Digital Input 8	0V return or 24 Vac	
Digital Input 9	0V return or 24 Vac	
Digital Input 10	0V return or 24 Vac	
Digital Input 11	0V return or 24 Vac	
Digital Input 12	0V return or 24 Vac	
Analogue Input 1	Probe input	Note 2
Analogue Input 2	Probe input	
Analogue Input 3	Probe input	
Analogue Input 4	Probe input	
Analogue Input 5	Probe input	
Analogue Input 6	Probe input	
Analogue Input 7	Probe input	
Analogue Input 8	Probe input	
Variable Analogue Input 1	Analogue input	4-20mA, 0-5V or 0-10V Input See note 3
Variable Analogue Input 2	Analogue input	
Variable Analogue Input 3	Analogue input	
Variable Analogue Output 1	Analogue output	4-20mA, 0-20mA, 0-5V or 0-10V Output
Variable Analogue Output 2	Analogue output	
Relay 1	N/O, N/C and Common	Volt Free
Relay 2	N/O, N/C and Common	Volt Free
Relay 3	N/O, N/C and Common	Volt Free
Relay 4	N/O, N/C and Common	Volt Free
Relay 5	N/O, N/C and Common	Volt Free
Relay 6	N/O, N/C and Common	Volt Free
Relay 7	N/O, N/C and Common	Volt Free
Relay 8	N/O, N/C and Common	Volt Free
Relay 9	N/O, N/C and Common	Volt Free
Relay 10	N/O, N/C and Common	Volt Free
Relay 11	N/O, N/C and Common	Volt Free
Relay 12	N/O, N/C and Common	Volt Free
Status LED	Healthy LED	When powered up the LED will flash off/on every 0.5 seconds. Note 3

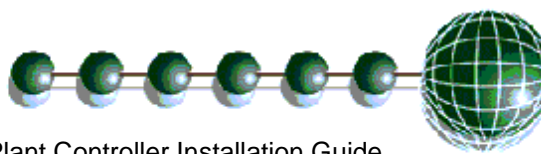
Note 1: 24 Vac must have the same 24 Vac return as the supply voltage. If using the Plant controller 24V power supply only the 24Vac signal from the supply is required for the digital input.

Do not connect the 0V from the power supply to the digital input common. See [Appendix 3](#) for digital Status input connection wiring. If the Status LED is present then Appendix 3 is not relevant. See appendix 4.

If using an external 24V power supply to signal a status change then both a common (0V) and status input signal (24V) is required for the appropriate digital input. See [Appendix 3](#) for digital Status input connection wiring. If the Status LED is present then Appendix 3 is not relevant. See appendix 4.



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Mercury Plant Controller Installation Guide

Note 2: Several probe types are available, see [Probe Type](#)

Note 3: The Status LED is not present on older variants of the Plant controller hardware. If the status LED is present and the Plant controller software is V1.7 or greater then Analogue inputs 1 to 3 are configurable either as a 4-20mA input or a 0-10Vdc input. If the above criteria is not met then Analogue inputs 1 to 3 are configurable as 4-20mA inputs only. In software version 2.6 or higher there is the option to have 4-20mA, 0-5V and 0-10V Inputs and 4-20mA, 0-20mA, 0-5V and 0-10V Outputs

Setting up the controller

Set-up access to the controller can be achieved several ways

- Through the front mounted buttons on the remote display
- Direct access by PC via a USB connection
- Direct access by a PC via an Ethernet Connection
- Through the RDM Data Manager.

Set-up Mode

Set-up through front buttons

To enter set-up mode, hold the Enter and Down buttons together for approximately 3 seconds until the message “Ent” appears on the display. Now press the Enter button again to enter the function menu. IO will be displayed. Scroll up or down to go through the list. Alternatively use either a PC connection for configurations or load a configuration from a memory-stick

Set-up Menu

LH Display	RH Display	Option	Menu Item seen in type:	Explained in Paragraph
IO		View Input/Output States	All types	View Input/Output States
PArA		Set/view Parameters	All types	Set/view parameters
Unit		Set/View Probe Type & Units	All types	Set/View Units
Uni		Set Universal IO	All types	Universal IO
StA		Set Status Input Type	All types	Status Input Type
rLy		Inverts the relay function	All types	Set Relay Output
TyPE		Set/View Controller Type	All types	Set/view product type
rtc		Set/view Clock (rtc = Real Time Clock)	All types	Real Time Clock
nEt		Set/view network configuration	All types	Network Configuration
bCSt		Broadcast (Pressures)	All types	Broadcast
SoFt		View software version	All types	
USb		Save/Load onto USB device	All types	USB
OFSt		Temperature probe offsets	All types	Set Probe Offsets
ESC		Exit set-up mode		

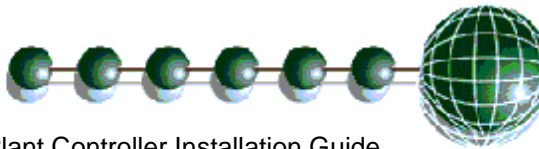
Recommended set-up method

It is recommended that this controller is set-up using a direct connection to a PC See [Setup via a PC](#)

If you are not connecting to a network and want to set up the controller through the buttons we recommend you use the following order from the function menu.



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Universal IO

Setting up from controller display, navigate to the screen “Uni” and select from the following table for U-01 to U-08. This selects what the Universal IO (U-01 to U-08) can be set for.

NOTE: UniIO U-01 to U-03 can only be set as Inputs, **UniIO U-04 and U-05** can only be set for Outputs and **UniIO U-06 to U-08** are seen in settings but are not present on the controller hardware and are for future development.

U-01 to U-03 (Variable Inputs) can be set to 0, 1 or 2.

U-04 and U-05 (Variable Outputs) can be set to 3, 4, 5 or 6.

U-06 to U-08 do not use.

0. 4-20mA Input
1. 0-10V Input
2. 0-5V Input
3. 4-20mA Output
4. 0-20mA Output
5. 0-10V Output
6. 0-5V Output

Input Type

The 3 analogue inputs can be set individually to either of the following,

0. 4 – 20mA Input (Default)
1. 0 – 10Vdc Input
2. 0 – 5Vdc Input

Output Type

The 2 analogue outputs can individually be set to either of the following: -

3. 4 – 20mA Output (Default)
4. 0 – 20mA Output
5. 0 – 10V dc Output
6. 0 – 5Vdc Output

Status Input Type

Navigate to the screen “StA”

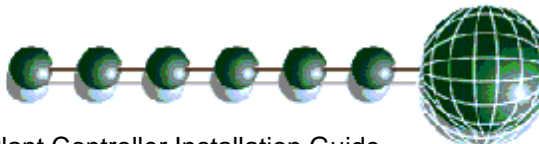
Selects whether the status inputs require a 0V return or 24Vac return signal See: [Note 1](#)

Select 1 for Input type 0V return

Select 2 for Input type 24V ac return



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rtc. Real time clock

(This will automatically synchronise on network systems)

1. Use the up or down buttons to scroll through the display until the display reads "rtc"
2. Press enter. The display will show "t-1". Press enter again
3. Scroll hours up or down (0 – 23) press enter
4. Use up button to select "t-2", press enter
5. Scroll minutes up or down (0 – 59) press enter
6. Repeat for t-3 (seconds 0 – 59)
7. Repeat for t-4 (Days up to 31)
8. Repeat for t-5 (months up to 12)
9. Repeat for t-6 (Year up to 99)
10. Use up button to display "ESC", press enter to display "rtc"

Time clock is now set

type. Set/view controller type

1. From the function menu scroll to "type", press enter
2. Use the up/down buttons to scroll through the type values. (See [configuration](#) on page 4)
3. Press enter.

The controller will reset with the selected type now programmed.

Type Change

NOTE : When changing controller types from one type to another always check the parameters and the controller configuration to ensure they are appropriate for the application selected.

Broadcast

Broadcast allows pressure readings on the variable analogue Inputs to be broadcast over a Data Manager IP network. These pressure readings can then be used by Mercury Switches and Mercury IP Modules to calculate evaporator temperatures.

Note: Mercury Plant Controller Software must version 2.4 or higher

Note: If broadcasting pressure to a Mercury Switch. Mercury switch must be software version 1.9 or higher.

Note: If broadcasting to a Mercury IP Module. IP Module must be software version 1.1 or higher

See RDM Mercury Switch User Guide (PR0018-PHI) for further information.

0 = Feature Disabled

1 = Feature Enabled

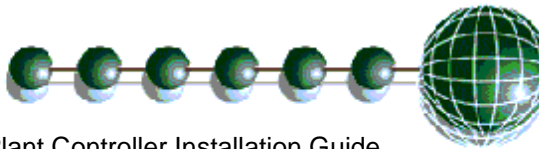
Set/View Probe Types & Units

This operation is only available at the controller display or via a PC connection to the Plant controller, it cannot be set remotely via the Data manager front end system. Probe type changes affect all probes, they cannot be set individually to different types.

This option allows the user to set the probe types and units.



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Mercury Plant Controller Installation Guide

Note: If the units are set to $^{\circ}\text{C}$, pressure will be displayed in Bar, if units are set to $^{\circ}\text{F}$, pressure will be displayed in PSI.

Unit Number	Probe Type	Units
0	Probes not used	$^{\circ}\text{C}$
1	PT1000	$^{\circ}\text{C}$
2	PT1000	$^{\circ}\text{F}$
3	NTC2K	$^{\circ}\text{C}$
4	NTC2K	$^{\circ}\text{F}$
5	NTC470R	$^{\circ}\text{C}$
6	NTC470R	$^{\circ}\text{F}$
7	NTC700R	$^{\circ}\text{C}$
8	NTC700R	$^{\circ}\text{F}$
9	NTC3K	$^{\circ}\text{C}$
10	NTC3K	$^{\circ}\text{F}$
11	NTC2K25	$^{\circ}\text{C}$
12	NTC2K25	$^{\circ}\text{F}$
13	NTC100K	$^{\circ}\text{C}$
14	NTC100K	$^{\circ}\text{F}$
15	NTC5K	$^{\circ}\text{C}$
16	NTC5K	$^{\circ}\text{F}$
17	NTC6K	$^{\circ}\text{C}$
18	NTC6K	$^{\circ}\text{F}$
19	NTC10K	$^{\circ}\text{C}$
20	NTC10K	$^{\circ}\text{F}$
21	NTC10K (2)	$^{\circ}\text{C}$
22	NTC10K (2)	$^{\circ}\text{F}$

Temperature probe range -60 degree Celsius to +128 degree Celsius.

Set/View Offset

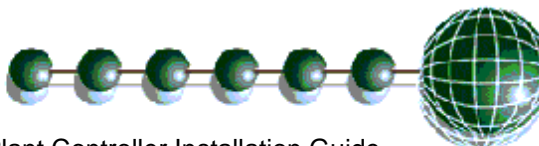
This feature allows the probe display temperature to be offset by the value selected: Each of the 8 probes has an individual offset, see the table below: - C-01 = Probe 1 etc.

Note: This can only be set at the controller display and cannot be set remotely by a Data Manager front-end.

OFSt Display	Range	Step	Default
C-01	$\pm 20^{\circ}$	0.1	0
C-02	$\pm 20^{\circ}$	0.1	0
C-03	$\pm 20^{\circ}$	0.1	0
C-04	$\pm 20^{\circ}$	0.1	0
C-05	$\pm 20^{\circ}$	0.1	0
C-06	$\pm 20^{\circ}$	0.1	0
C-07	$\pm 20^{\circ}$	0.1	0
C-08	$\pm 20^{\circ}$	0.1	0



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Network Configuration

There are two network connection options

- IP-L (Rotary switches set to “000”)
- IP-r (Rotary switches set to “***” where * is a number between 0 and 9)

IP-L allows you to fix an IP address into the controller, which you would use when you are connecting the controllers onto a customer’s local area network. This would allow the customer to view each controller using Internet Explorer

IP-r (normally used mode) allows you to give each controller on the system a unique network ID. This ID is then allocated a dynamic IP address by the system DHCP server (such as the RDM Data Director)

IP-L

To configure the Plant Controller for IP-L, set all three rotary switches to zero. The unit should then be connected to the network.

1. nEt. From the function menu you can now select nEt
 - Press enter and the display will show “IP-L”, press enter
 - You can now set the address using the table below

Display	Option
IP-1	IP Address byte 1
IP-2	IP Address byte 2
IP-3	IP Address byte 3
IP-4	IP Address byte 4
nL	Network Mask Length
gt-1	Gateway Address byte 1
gt-2	Gateway Address byte 2
gt-3	Gateway Address byte 3
gt-4	Gateway Address byte 4
ESC	Exit network menu. N.B. this option must be selected to save any changes made in this menu

IP-r

To configure the communication module for IP-r, set the three rotary switches to give each controller a unique identifier (other than 000). The module should then be connected to the controller and the network via the Ethernet port. The Data Manager will use DHCP to allocate the controller an IP address.

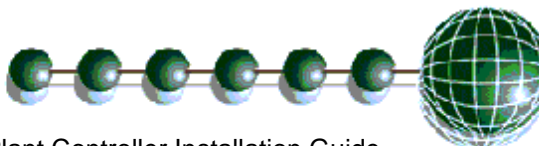
- From the function menu select nEt
- Press enter and the display will show “IP-r”, press enter
- You can now view the address given by the DHCP server

IP1: Shows the first IP address value (10 in the example below)
IP2: Shows the second IP address value (1 in the example below)
IP3: Shows the third IP address value (2 in the example below)
IP4: Shows the forth IP address value (86 in the example below)

Example: 10.1.2.86



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Mercury Plant Controller Installation Guide

PArA. Set/view parameters

1. From the function menu scroll to PArA
2. Pressing Enter while PArA is displayed will enter the parameter menu.

The first parameter option will be displayed as P-01. Pressing the Up or Down button will present the other parameter options P-02, P-03 etc. See the parameter list below to find what parameter number corresponds to which actual parameter.

Pressing the Enter button will show the current value of the selected parameter. Press Up or Down to modify the value and press Enter again to save the value. The parameter list number will be displayed again.

Two other options are present in the parameter menu – dFLt and ESC. Selecting ESC will exit the parameter set-up mode. Selecting dFLt will reset all parameters back to the default values for the current controller type.

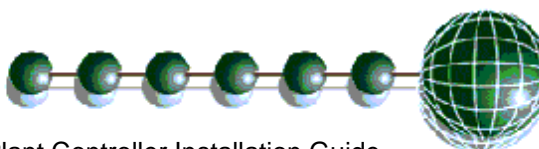
Parameter Tables:

Parameter table for Pack Controller (Type 1, Fuzzy)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P473	Section 1 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Starts/Hour	0 - 60	1	-	10
P-24	Section 1 Run Smallest **	0 = Off, 1 = On	1	-	0
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P490	Section 1 Gas Dump	0 = Off, 1 = On	1	-	0
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0
P495	Sect 1 Compressor Unload	0 = Off, 1 = On	1	-	0
P497	Sect 1 Equal	0 = Off, 1 = On	1	-	0
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P472	Run Proof	0 = Off, 1 = On	1	-	0
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10



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Mercury Plant Controller Installation Guide

P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P111	Section 1 Stage 12				
P120	Section 1 Stage 1 Size	0.0 – 60.0	0.1	-	0.0
P131	Section 1 Stage 12 Size				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.
Span is the full range of the transducer
Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)

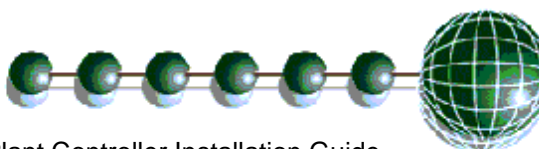
If only transducer input 1 is in use please see [Note 10](#) also.

Run smallest=on: - When all compressors are off (because the target pressure has been satisfied) the controller, when the pressure rises, will always turn on the smallest compressor after the variable output has reached 100%. If the ASC timer is running for the smallest compressor, the controller will **NOT bring on any other available compressors, the variable output will remain at 100% and the controller will wait until the ASC timer has elapsed and then turn on the smallest.

Please note that this is true for **any** pressure condition.



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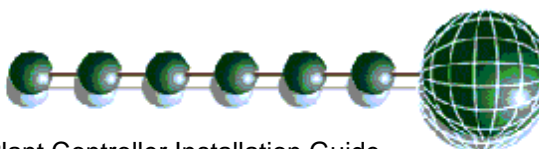
Mercury Plant Controller Installation Guide

Parameter table for Dual Pack Controller (Type 2, Fuzzy)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P473	Section 1 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Starts/Hour	0 - 60	1	-	10
P-24	Section 1 Run Smallest **	0 = Off 1 = On	1	-	0
P-26	Section 1 Inverter	0 = Off 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P490	Section 1 Gas Dump	0 = Off 1 = On	1	-	0
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0
P495	Sect 1 Compressor Unload	0 = Off, 1 = On	1	-	0
P497	Sect 1 Equal	0 = Off, 1 = On	1	-	0
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-30	Section 1 Alarm Delay	00:00 - 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 - 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P474	Section 2 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-41	Section 2 Target Pressure Above P-40	-3.4 - 180	0.1	Bar	0.5
P-42	Section 2 Target Pressure Below P-40	-3.4 - 180	0.1	Bar	0.5
P-43	Section 2 Starts/Hour	0 - 60	1	-	10
P-44	Section 2 Run Smallest **	0 = Off, 1 = On	1	-	0
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-	0
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry	1	-	0



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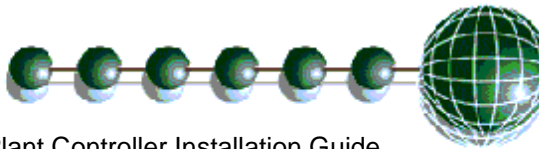


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		3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries			
P445	Section 2 INV Minimum	0 – 100	1	%	0
P447	Section 2 INV Maximum	0 – 100	1	%	100
P491	Section 2 Gas Dump	0 = Off, 1 = On	1	-	0
P493	Section 2 Gas diff	-3.4 – 180	0.1	Bar	0.5
P471	Section 2 Always Run last	0 = Off 1 = On	1	-	0
P496	Sect 2 Compressor Unload	0 = Off, 1 = On	1	-	0
P498	Sect 1 Equal	0 = Off, 1 = On	1	-	0
P-47	Section 2 Response On Speed	1 – 60	1	-	5
P-48	Section 2 Response Off Speed	1 – 60	1	-	5
P-49	Section 2 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-35	Section 2 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P449	Section 2 Fail	0 = Off 1 = On	1	-	0
P472	Run Proof	0 = Off, 1 = On	1		0
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-	1
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P111	Section 1 Stage 12				



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P120 ↓ P131	Section 1 Stage 1 Size ↓ Section 1 Stage 12 Size	0.0 – 60.0	0.1	-	0.0
P140 ↓ P151	Section 2 Stage 1 ↓ Section 2 Stage 12	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P160 ↓ P171	Section 2 Stage 1 Size ↓ Section 2 Stage 12 Size	0.0 – 60.0	0.1	-	0.0
dFLt	Restore Default settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.

Span is the full range of the transducer

Offset is the value below zero.

Note. The controller uses absolute pressure; if guage pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar

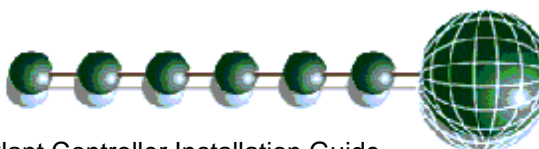
Span would be 190 (13 bar)

Offset would be -15 (-1 bar)

Run smallest=on: - When all compressors are off (because the target pressure has been satisfied) the controller, when the pressure rises, will always turn on the smallest compressor after the variable output has reached 100%. If the ASC timer is running for the smallest compressor, the controller will **NOT bring on any other available compressors, the variable output will remain at 100% and the controller will wait until the ASC timer has elapsed and then turn on the smallest. Please note that this is true for **any** pressure condition.



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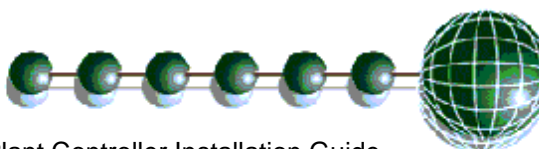


Parameter table for Pack/Condenser Controller (Type 3, Fuzzy)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	34.4
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P473	Section 1 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Starts/Hour	0 - 60	1	-	10
P-24	Section 1 Run Smallest **	0 = Off, 1 = On	1	-	0
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P490	Section 1 Gas Dump	0 = Off, 1 = On	1	-	0
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0
P495	Sect 1 Compressor Unload	0 = Off, 1 = On	1	-	0
P497	Sect 1 Equal	0 = Off, 1 = On	1	-	0
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar	12.7
P-41	Section 2 Target Pressure Above P-40	-3.4 - 180	0.1	Bar	0.5
P-42	Section 2 Target Pressure Below P-40	-3.4 - 180	0.1	Bar	0.5
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-	0
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P445	Section 2 INV Minimum	0 - 100	1	%	0
P447	Section 2 INV Maximum	0 - 100	1	%	100
P-47	Section 2 Response On Speed	1 - 60	1	-	5
P-48	Section 2 Response Off Speed	1 - 60	1	-	5



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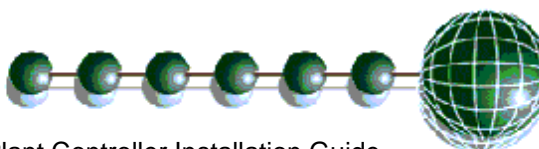


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P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar	17.9
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar	6.8
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar	6.2
P-35	Section 2 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P449	Section 2 Fail	0 = Off, 1 = On	1	-	0
P450	Section 2 Sticky Fans	0 - 12	1	-	0
P451	Section 2 Night Set Back	0 = Off, 1 = On 2 = Local 3 = Remote	1	-	0
P452	Section 2 Night Reduction	0 - 100	1	%	30
P453	Section 2 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P454	Section 2 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P455	Sect 2 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P456	Section 2 Day Reduction	0 - 100	1	%	30
P457	Section 2 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P458	Section 2 Transducer fail Level	0 - 100	1	%	45
P459	Section 2 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P460	Section 2 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	1
P412	Section 2 Drop Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			2
P461	Section 2 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P462	Section 2 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P463	Section 2 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P464	Section 2 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P465	Section 2 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P466	Section 2 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P467	Section 2 Low Limit	-3.4 - 180	0.1	Bar	8.2
P468	Section 2 High Limit	-3.4 - 180	0.1	Bar	23.0
P469	Section 2 Condenser offset	0 - 20	0.1	°C	6
P439	Section 2 Split	0 = Off, 1 = On	1	-	0
P431	Section 2 Split Temp	-60 - 128	0.1	°C	7.2
P433	Section 2 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0
P435	Sect 2 Split Press	-3.4 - 180	0.1	Bar	15.2
P437	Sect 2 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P441	Sect 2 Heat reclaim	0 = Off, 1 = On 2 = On Rly	1	-	0



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P474	Sect 2 Ext Trgt	-3.4 - 180	0.1	°C	14.7
P475	Dis Trip	-3.4 - 180	0.1	Bar	22.8
P476	Dis Diff	-3.4 - 180	0.1	Bar	2.0
P472	Run Proof	0 = Off, 1 = On	1		0
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-	1
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P111	Section 1 Stage 12				
P120	Section 1 Stage 1 Size	0.0 – 60.0	0.1	-	0.0
P131	Section 1 Stage 12 Size				
P140	Section 2 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P151	Section 2 Stage 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.

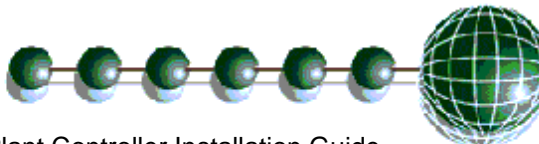
Span is the full range of the transducer

Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.



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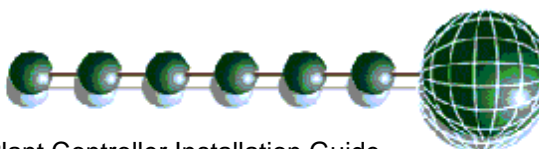
Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)

****Run smallest = on :** - When all compressors are off (because the target pressure has been satisfied) the controller, when the pressure rises, will always turn on the smallest compressor after the variable output has reached 100%. If the ASC timer is running for the smallest compressor, the controller will **NOT** bring on any other available compressors, the variable output will remain at 100% and the controller will wait until the ASC timer has elapsed and then turn on the smallest.

Please note that this is true for **any** pressure condition.



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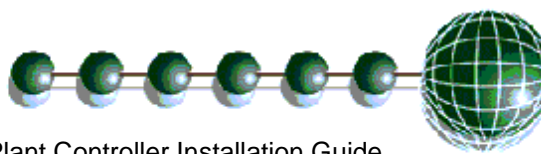
Mercury Plant Controller Installation Guide

Parameter table for Dual Condenser Controller (Type 4, Fuzzy)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	34.4
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	34.4
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	12.7
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	17.9
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	6.8
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	6.2
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P400	Section 1 Sticky Fans	0 - 12	1	-	0
P401	Section 1 Night Set Back	0 = Off, 1 = On 2 = Local 3 = Remote	1	-	0
P402	Section 1 Night Reduction	0 - 100	1	%	30
P403	Section 1 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P404	Section 1 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P405	Section 1 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P406	Section 1 Day Reduction	0 - 100	1	%	25
P407	Section 1 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P408	Section 1 Transducer fail Level	0 - 100	1	%	45
P409	Section 1 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P410	Section 1 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	1



Ensure that all power is
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this product

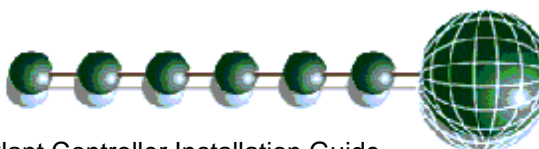


Mercury Plant Controller Installation Guide

P411	Section 1 Drop select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	2
P414	Section 1 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P415	Section 1 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P416	Section 1 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P417	Section 1 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P418	Section 1 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P419	Section 1 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P420	Section 1 Low Limit	-3.4 - 180	0.1	Bar	8.2
P421	Section 1 High Limit	-3.4 - 180	0.1	Bar	23.0
P422	Section 1 Condenser offset	0 - 20	0.1	°C	6
P438	Section 1 Split	0 = Off 1 = On	1	-	0
P430	Section 1 Split Temp	-60.0 – 128.0	0.1	°C	7.2
P432	Section 1 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0
P434	Sect 1 Split Press	-3.4 - 180	0.1	Bar	15.2
P436	Sect 1 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P440	Sect 1 Heat reclaim	0 = Off 1 = On 2 = On Rly	1	-	0
P473	Section 1 Ext trgt	-3.4 - 180	0.1	Bar	14.7
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar	12.7
P-41	Section 2 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-42	Section 2 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-	0
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P445	Section 2 INV Minimum	0 - 100	1	%	0
P447	Section 2 INV Maximum	0 - 100	1	%	100
P-47	Section 2 Response On Speed	1 - 60	1	-	5
P-48	Section 2 Response Off Speed	1 - 60	1	-	5
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar	17.9
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar	6.8
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar	6.2
P-35	Section 2 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P449	Section 2 Fail	0 = Off, 1 = On	1	-	0
P450	Section 2 Sticky Fans	0 – 12	1	-	0
P451	Section 2 Night Set Back	0 = Off 1 = On 2 = Local 3 = Remote	1	-	0



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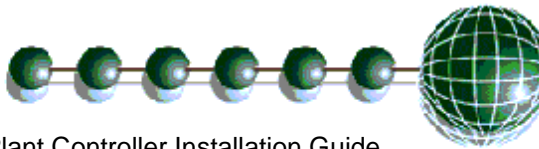


Mercury Plant Controller Installation Guide

P452	Section 2 Night Reduction	0 – 100	1	%	30
P453	Section 2 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P454	Section 2 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P455	Section 2 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P456	Section 2 Day Reduction	0 – 100	1	%	25
P457	Section 2 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P458	Section 2 Transducer fail Level	0 – 100	1	%	45
P459	Section 2 Control Type	0 = Fixed 1 = Floating	1	-	0
P460	Section 2 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	1
P412	Section 2 Drop Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	2
P461	Section 2 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P462	Section 2 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P463	Section 2 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P464	Section 2 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P465	Section 2 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P466	Section 2 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P467	Section 2 Low Limit	-3.4 - 180	0.1	Bar	8.2
P468	Section 2 High Limit	-3.4 - 180	0.1	Bar	23.0
P469	Section 2 Condenser offset	0 - 20	0.1	°C	6
P439	Section 2 Split	0 = Off 1 = On	1	-	0
P431	Section 2 Split Temp	-60 - 128	0.1	°C	7.2
P433	Section 2 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0
P435	Sect 2 Split Press	-3.4 - 180	0.1	Bar	15.2
P437	Sect 2 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P441	Sect 2 Heat reclaim	0 = Off 1 = On 2 = On Rly	1	-	0
P474	Sect 2 Ext Trgt	-3.4 - 180	0.1	°C	14.7
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00



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Mercury Plant Controller Installation Guide

P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-	1
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P111	Section 1 Stage 12				
P140	Section 2 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
P151	Section 2 Stage 12				
DFLt	Restore Default Settings (Front panel Only)				
Esc					

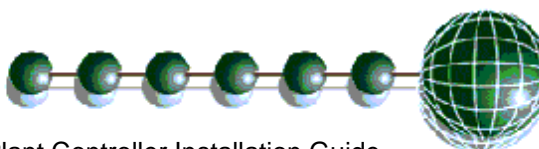
* Span and Offset allows for the full range of the transducer to be used by the controller.
Span is the full range of the transducer
Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)



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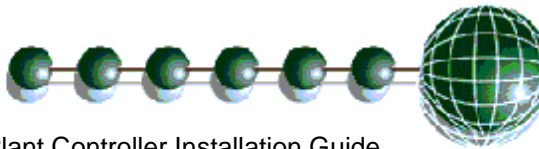


Parameter table for Condenser Controller (Type 5, Fuzzy)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	34.4
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	12.7
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	17.9
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	6.8
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	6.2
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P400	Section 1 Sticky Fans	0 - 12	1	-	0
P401	Section 1 Night Set Back	0 = Off, 1 = On 2 = Local 3 = Remote	1	-	0
P402	Section 1 Night Reduction	0 - 100	1	%	30
P403	Section 1 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P404	Section 1 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P405	Section 1 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P406	Section 1 Day Reduction	0 - 100	1	%	25
P407	Section 1 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P408	Section 1 Transducer fail Level	0 - 100	1	%	45
P409	Section 1 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P410	Section 1 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	1



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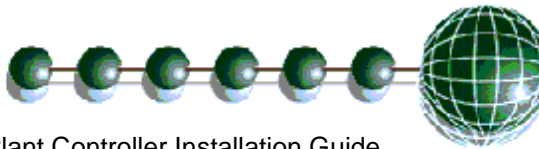


Mercury Plant Controller Installation Guide

P411	Section 1 Drop select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	2
P414	Section 1 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P415	Section 1 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P416	Section 1 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P417	Section 1 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P418	Section 1 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P419	Section 1 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P420	Section 1 Low Limit	-3.4 - 180	0.1	Bar	8.2
P421	Section 1 High Limit	-3.4 - 180	0.1	Bar	23.0
P422	Section 1 Condenser offset	0 - 20	0.1	°C	6
P438	Section 1 Split	0 = Off. 1 = On	1	-	0
P430	Section 1 Split Temp	-60.0 - 128.0	0.1	°C	7.2
P432	Section 1 Split Temp Diff	0.0 - 10.0	0.1	°C	2.0
P434	Sect 1 Split Press	-3.4 - 180	0.1	Bar	15.2
P436	Sect 1 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P440	Sect 1 Heat reclaim	0 = Off 1 = On 2 = On Rly	1	-	0
P473	Section 1 Ext trgt	-3.4 - 180	0.1	Bar	14.7
P-60	Status fault Delay	00:00 - 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 - 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 - 99:00	01:00	mins:sec	05:00
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				



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Mercury Plant Controller Installation Guide

P100	Section 1 Stage 1	(0) None, (1) Unused, (2) Compressor, (3) Loader, (4) Fan (5) Inverter (6) Trim (7) Comp Run	1	-	0
↓	↓				
P111	Section 1 Stage 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.

Span is the full range of the transducer

Offset is the value below zero.

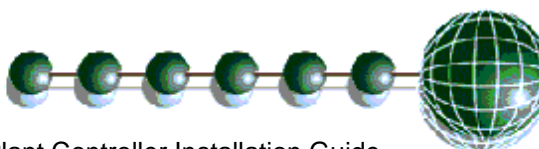
Note. The controller uses absolute pressure; if guage pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
 Span would be 190 (13 bar)
 Offset would be -15 (-1 bar)

If only transducer input 1 is in use please see [Note 10](#) also.



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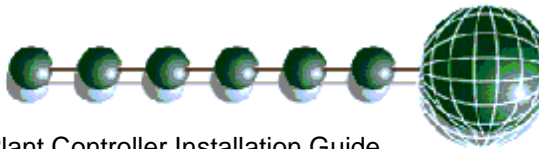


Parameter table for Pack Controller (Type 6, Staged)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P473	Section 1 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Number of Stages	0 - 12	1	-	0
P-24	Section 1 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-25	Section 1 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-26	Section 1 Inverter	0 = Off 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P490	Section 1 Gas Dump	0 = Off 1 = On	1	-	0
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5
P470	Section 1 Always Run last	0 = Off 1 = On	1	-	0
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P472	Run Proof	0 = Off, 1 = On	1	-	0
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00



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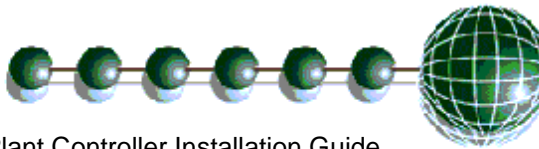


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P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1 Relay 1	0 = off 1 = on	1	-	0
P111	Section 1 Stage 1 Relay 12				
P112	Section 1 Stage 2 Relay 1	0 = off 1 = on	1	-	0
P123	Section 1 Stage 2 Relay 12				
P124	Section 1 Stage 3 Relay 1	0 = off 1 = on	1	-	0
P135	Section 1 Stage 3 Relay 12				
P136	Section 1 Stage 4 Relay 1	0 = off 1 = on	1	-	0
P147	Section 1 Stage 4 Relay 12				
P148	Section 1 Stage 5 Relay 1	0 = off 1 = on	1	-	0
P159	Section 1 Stage 5 Relay 12				
P160	Section 1 Stage 6 Relay 1	0 = off 1 = on	1	-	0
P171	Section 1 Stage 6 Relay 12				
P172	Section 1 Stage 7 Relay 1	0 = off 1 = on	1	-	0
P183	Section 1 Stage 7 Relay 12				
P184	Section 1 Stage 8 Relay 1	0 = off 1 = on	1	-	0
P195	Section 1 Stage 8 Relay 12				



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P196 ↓	Section 1 Stage 9 Relay 1 ↓	0 = off 1 = on	1	-	0
P207	Section 1 Stage 9 Relay 12				
P208 ↓	Section 1 Stage 10 Relay 1 ↓	0 = off 1 = on	1	-	0
P219	Section 1 Stage 10 Relay 12				
P220 ↓	Section 1 Stage 11 Relay 1 ↓	0 = off 1 = on	1	-	0
P231	Section 1 Stage 11 Relay 12				
P232 ↓	Section 1 Stage 12 Relay 1 ↓	0 = off 1 = on	1	-	0
P243	Section 1 Stage 12 Relay 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.
Span is the full range of the transducer
Offset is the value below zero.

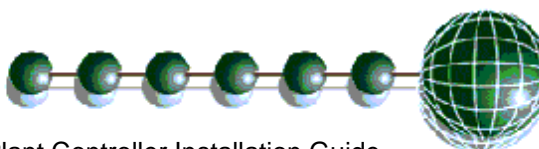
Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)

If only transducer input 1 in use please see [Note 10](#) also.



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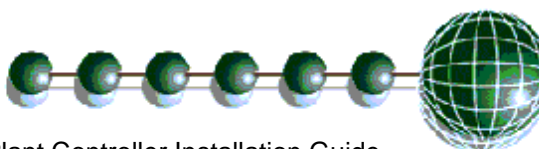


Parameter table for Dual Pack Controller (Type 7, Staged)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P473	Section 1 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Number of Stages	0 - 12	1	-	0
P-24	Section 1 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-25	Section 1 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P490	Section 1 Gas Dump	0 = Off, 1 = On	1	-	0
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P474	Section 2 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-41	Section 2 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-42	Section 2 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-43	Section 2 Number of Stages	0 - 12	1	-	0
P-44	Section 2 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-45	Section 2 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-	0
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0



Ensure that all power is switched off before installing or maintaining this product

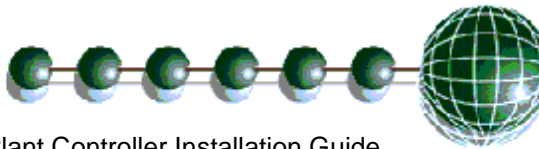


Mercury Plant Controller Installation Guide

P445	Section 2 INV Minimum	0 - 100	1	%	0
P447	Section 2 INV Maximum	0 - 100	1	%	100
P491	Section 2 Gas Dump	0 = Off, 1 = On	1	-	0
P493	Section 2 Gas diff	-3.4 - 180	0.1	Bar	0.5
P471	Section 2 Always Run last	0 = Off, 1 = On	1	-	0
P-47	Section 2 Response On Speed	1 - 60	1	-	5
P-48	Section 2 Response Off Speed	1 - 60	1	-	5
P-49	Section 2 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-35	Section 2 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P449	Section 2 Fail	0 = Off, 1 = On	1	-	0
P472	Run Proof	0 = Off, 1 = On	1	-	0
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-	1
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1 Relay 1	0 = off 1 = on	1	-	0
P111	Section 1 Stage 1 Relay 12				
P112	Section 1 Stage 2 Relay 1	0 = off 1 = on	1	-	0
P123	Section 1 Stage 2 Relay 12				
P124	Section 1 Stage 3 Relay 1	0 = off 1 = on	1	-	0
P135	Section 1 Stage 3 Relay 12				



Ensure that all power is switched off before installing or maintaining this product

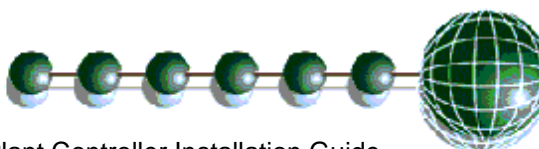


Mercury Plant Controller Installation Guide

P136 ↓	Section 1 Stage 4 Relay 1 ↓	0 = off 1 = on	1	-	0
P147	Section 1 Stage 4 Relay 12				
P148 ↓	Section 1 Stage 5 Relay 1 ↓	0 = off 1 = on	1	-	0
P159	Section 1 Stage 5 Relay 12				
P160 ↓	Section 1 Stage 6 Relay 1 ↓	0 = off 1 = on	1	-	0
P171	Section 1 Stage 6 Relay 12				
P172 ↓	Section 1 Stage 7 Relay 1 ↓	0 = off 1 = on	1	-	0
P183	Section 1 Stage 7 Relay 12				
P184 ↓	Section 1 Stage 8 Relay 1 ↓	0 = off 1 = on	1	-	0
P195	Section 1 Stage 8 Relay 12				
P196 ↓	Section 1 Stage 9 Relay 1 ↓	0 = off 1 = on	1	-	0
P207	Section 1 Stage 9 Relay 12				
P208 ↓	Section 1 Stage 10 Relay 1 ↓	0 = off 1 = on	1	-	0
P219	Section 1 Stage 10 Relay 12				
P220 ↓	Section 1 Stage 11 Relay 1 ↓	0 = off 1 = on	1	-	0
P231	Section 1 Stage 11 Relay 12				
P232 ↓	Section 1 Stage 12 Relay 1 ↓	0 = off 1 = on	1	-	0
P243	Section 1 Stage 12 Relay 12				
P244 ↓	Section 2 Stage 1 Relay 1 ↓	0 = off 1 = on	1	-	0
P255	Section 2 Stage 1 Relay 12				
P256 ↓	Section 2 Stage 2 Relay 1 ↓	0 = off 1 = on	1	-	0
P267	Section 2 Stage 2 Relay 12				



Ensure that all power is
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this product



Mercury Plant Controller Installation Guide

P268 ↓	Section 2 Stage 3 Relay 1 ↓	0 = off 1 = on	1	-	0
P279	Section 2 Stage 3 Relay 12				
P280 ↓	Section 2 Stage 4 Relay 1 ↓	0 = off 1 = on	1	-	0
P291	Section 2 Stage 4 Relay 12				
P292 ↓	Section 2 Stage 5 Relay 1 ↓	0 = off 1 = on	1	-	0
P303	Section 2 Stage 5 Relay 12				
P-304 ↓	Section 2 Stage 6 Relay 1 ↓	0 = off 1 = on	1	-	0
P315	Section 2 Stage 6 Relay 12				
P316 ↓	Section 2 Stage 7 Relay 1 ↓	0 = off 1 = on	1	-	0
P327	Section 2 Stage 7 Relay 12				
P328 ↓	Section 2 Stage 8 Relay 1 ↓	0 = off 1 = on	1	-	0
P339	Section 2 Stage 8 Relay 12				
P340 ↓	Section 2 Stage 9 Relay 1 ↓	0 = off 1 = on	1	-	0
P351	Section 2 Stage 9 Relay 12				
P352 ↓	Section 2 Stage 10 Relay 1 ↓	0 = off 1 = on	1	-	0
P363	Section 2 Stage 10 Relay 12				
P364 ↓	Section 2 Stage 11 Relay 1 ↓	0 = off 1 = on	1	-	0
P375	Section 2 Stage 11 Relay 12				
P376 ↓	Section 2 Stage 12 Relay 1 ↓	0 = off 1 = on	1	-	0
P387	Section 2 Stage 12 Relay 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.

Span is the full range of the transducer

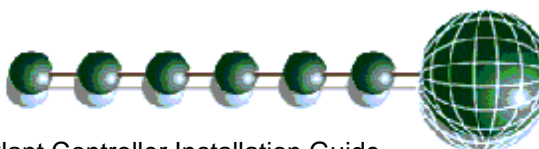
Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)



Ensure that all power is
switched off before
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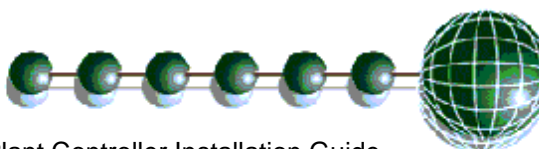


Parameter table for Pack/Condenser Controller (Type 8, Staged)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	13.8
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	34.4
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P473	Section 1 External Target Pressure	-3.4 - 180	0.1	Bar	3.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Number of Stages	0 -12	1	-	0
P-24	Section 1 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-25	Section 1 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P490	Section 1 Gas Dump	0 = Off, 1 = On	1	-	0
P492	Section 1 Gas Diff	-3.4 - 180	0.1	Bar	0.5
P470	Section 1 Always Run last	0 = Off, 1 = On	1	-	0
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-29	Section 1 Optimise Limit	-3.4 - 180	0.1	Bar	2.0
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar	12.7
P-41	Section 2 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-42	Section 2 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-43	Section 2 Number of Stages	0 -12	1	-	0
P-44	Section 2 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-45	Section 2 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-46	Section 2 Inverter	0 = Off, 1 = On	1	-	0
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P445	Section 2 INV Minimum	0 - 100	1	%	0



Ensure that all power is
switched off before
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this product

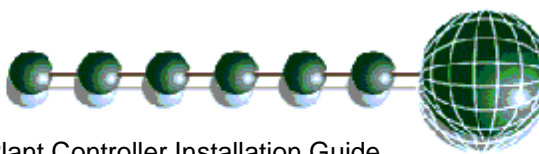


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P447	Section 2 INV Maximum	0 - 100	1	%	100
P-47	Section 2 Response On Speed	1 - 60	1	-	5
P-48	Section 2 Response Off Speed	1 - 60	1	-	5
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar	17.9
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar	6.8
P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar	6.2
P-35	Section 2 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P449	Section 2 Fail	0 = Off, 1 = On	1	-	0
P450	Section 2 Sticky Fans	0 - 12	1	-	0
P451	Section 2 Night Set Back	0 = Off 1 = On 2 = Local 3 = Remote	1	-	0
P452	Section 2 Night Reduction	0 - 100	1	%	30
P453	Section 2 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P454	Section 2 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P455	Section 2 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P456	Section 2 Day Reduction	0 - 100	1	%	25
P457	Section 2 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P458	Section 2 Transducer fail Level	0 - 100	1	%	45
P459	Section 2 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P460	Section 2 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	0
P412	Section 2 Drop Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			
P461	Section 2 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P462	Section 2 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P463	Section 2 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P464	Section 2 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P465	Section 2 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P466	Section 2 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P467	Section 2 Low Limit	-3.4 - 180	0.1	Bar	8.2
P468	Section 2 High Limit	-3.4 - 180	0.1	Bar	23.0
P469	Section 2 Condenser offset	0 - 20	0.1	°C	6
P439	Section 2 Split	0 = Off, 1 = On	1	-	0
P431	Section 2 Split Temp	-60 - 128	0.1	°C	7.2
P433	Section 2 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0



Ensure that all power is switched off before installing or maintaining this product

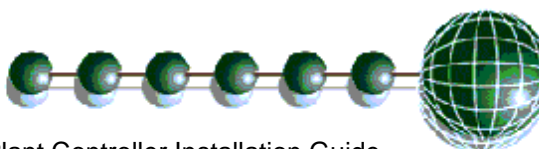


Mercury Plant Controller Installation Guide

P435	Sect 2 Split Press	-3.4 - 180	0.1	Bar	15.2
P437	Sect 2 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P441	Sect 2 Heat reclaim	0 = Off 1 = On 2 = On Rly	1	-	0
P474	Sect 2 Ext Trgt	-3.4 - 180	0.1	°C	14.7
P475	Dis Trip	-3.4 - 180	0.1	Bar	22.8
P476	Dis Diff	-3.4 - 180	0.1	Bar	2.0
P472	Run Proof	0 = Off, 1 = On	1		0
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-	1
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
P100	Section 1 Stage 1 Relay 1	0 = off 1 = on	1	-	0
P111	Section 1 Stage 1 Relay 12				
P112	Section 1 Stage 2 Relay 1	0 = off 1 = on	1	-	0
P123	Section 1 Stage 2 Relay 12				
P124	Section 1 Stage 3 Relay 1	0 = off 1 = on	1	-	0
P135	Section 1 Stage 3 Relay 12				
P136	Section 1 Stage 4 Relay 1	0 = off 1 = on	1	-	0
P147	Section 1 Stage 4 Relay 12				
P124	Section 1 Stage 3 Relay 1	0 = off 1 = on	1	-	0
P135	Section 1 Stage 3 Relay 12				



Ensure that all power is switched off before installing or maintaining this product



Mercury Plant Controller Installation Guide

P136 ↓	Section 1 Stage 4 Relay 1 ↓	0 = off 1 = on	1	-	0
P147	Section 1 Stage 4 Relay 12				
P148 ↓	Section 1 Stage 5 Relay 1 ↓	0 = off 1 = on	1	-	0
P159	Section 1 Stage 5 Relay 12				
P160 ↓	Section 1 Stage 6 Relay 1 ↓	0 = off 1 = on	1	-	0
P171	Section 1 Stage 6 Relay 12				
P172 ↓	Section 1 Stage 7 Relay 1 ↓	0 = off 1 = on	1	-	0
P183	Section 1 Stage 7 Relay 12				
P184 ↓	Section 1 Stage 8 Relay 1 ↓	0 = off 1 = on	1	-	0
P195	Section 1 Stage 8 Relay 12				
P196 ↓	Section 1 Stage 9 Relay 1 ↓	0 = off 1 = on	1	-	0
P207	Section 1 Stage 9 Relay 12				
P208 ↓	Section 1 Stage 10 Relay 1 ↓	0 = off 1 = on	1	-	0
P219	Section 1 Stage 10 Relay 12				
P220 ↓	Section 1 Stage 11 Relay 1 ↓	0 = off 1 = on	1	-	0
P231	Section 1 Stage 11 Relay 12				
P232 ↓	Section 1 Stage 12 Relay 1 ↓	0 = off 1 = on	1	-	0
P243	Section 1 Stage 12 Relay 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.

Span is the full range of the transducer

Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

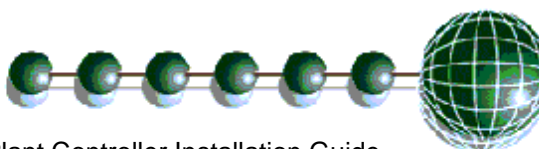
Example: Danfoss AKS 33 with range: -1 bar to 12 bar

Span would be 190 (13 bar)

Offset would be -15 (-1 bar)



Ensure that all power is
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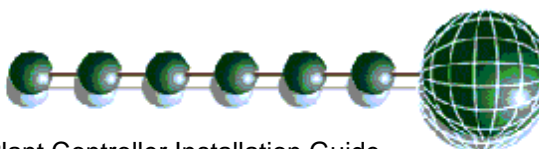


Parameter table for Dual Condenser Controller (Type 9, Staged)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	34.4
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	34.4
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Number of Stages	0 - 12	1	-	0
P-24	Section 1 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-25	Section 1 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off 1 = On	1	-	0
P400	Section 1 Sticky Fans	0 - 12	1	-	0
P401	Section 1 Night Set Back	0 = Off 1 = On 2 = Local 3 = Remote	1	-	0
P402	Section 1 Night Reduction	0 - 100	1	%	30
P403	Section 1 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P404	Section 1 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P405	Section 1 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P406	Section 1 Day Reduction	0 - 100	1	%	25
P407	Section 1 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P408	Section 1 Transducer fail Level	0 - 100	1	%	45
P409	Section 1 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P410	Section 1 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4	1	-	0



Ensure that all power is
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this product

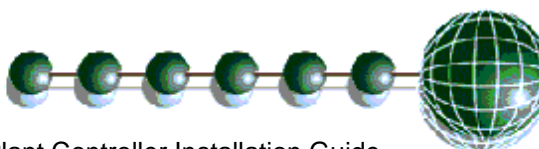


Mercury Plant Controller Installation Guide

		4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			
P411	Section 1 Drop select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			2
P414	Section 1 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P415	Section 1 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P416	Section 1 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P417	Section 1 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P418	Section 1 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P419	Section 1 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P420	Section 1 Low Limit	-3.4 - 180	0.1	Bar	8.2
P421	Section 1 High Limit	-3.4 - 180	0.1	Bar	23.0
P422	Section 1 Condenser offset	0 - 20	0.1	°C	6
P438	Section 1 Split	0 = Off 1 = On	1	-	0
P430	Section 1 Split Temp	-60.0 – 128.0	0.1	°C	7.2
P432	Section 1 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0
P434	Sect 1 Split Press	-3.4 - 180	0.1	Bar	15.2
P436	Sect 1 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P440	Sect 1 Heat reclaim	0 = Off 1 = On 2 = On Rly	1	-	0
P473	Section 1 Ext trgt	-3.4 - 180	0.1	Bar	14.7
P-40	Section 2 Target Pressure	-3.4 - 180	0.1	Bar	12.7
P-41	Section 2 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-42	Section 2 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-43	Section 2 Number of Stages	0 -12	1	-	0
P-44	Section 2 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-45	Section 2 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-46	Section 2 Inverter	0 = Off 1 = On	1	-	0
P443	Section 2 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P445	Section 2 INV Minimum	0 - 100	1	%	0
P447	Section 2 INV Maximum	0 - 100	1	%	100
P-47	Section 2 Response On Speed	1 - 60	1	-	5
P-48	Section 2 Response Off Speed	1 - 60	1	-	5
P-50	Section 2 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-51	Section 2 HP Alarm	-3.4 - 180	0.1	Bar	17.9
P-52	Section 2 LP Alarm	-3.4 - 180	0.1	Bar	6.8



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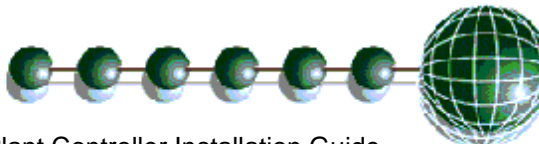


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P-53	Section 2 LP Shut-down	-3.4 - 180	0.1	Bar	6.2
P-35	Section 2 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P-449	Section 2 Fail	0 = Off, 1 = On	1	-	0
P450	Section 2 Sticky Fans	0 - 12	1	-	0
P451	Section 2 Night Set Back	0 = Off 1 = On 2 = Local 3 = Remote	1	-	0
P452	Section 2 Night Reduction	0 - 100	1	%	30
P453	Section 2 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P454	Section 2 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P455	Section 2 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P456	Section 2 Day Reduction	0 - 100	1	%	25
P457	Section 2 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P458	Section 2 Transducer fail Level	0 - 100	1	%	45
P459	Section 2 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P460	Section 2 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote	1	-	0
P412	Section 2 Drop Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			
P461	Section 2 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P462	Section 2 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P463	Section 2 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P464	Section 2 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P465	Section 2 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P466	Section 2 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P467	Section 2 Low Limit	-3.4 - 180	0.1	Bar	8.2
P468	Section 2 High Limit	-3.4 - 180	0.1	Bar	23.0
P469	Section 2 Condenser offset	0 - 20	0.1	°C	6
P439	Section 2 Split	0 = Off 1 = On	1	-	0
P431	Section 2 Split Temp	-60 - 128	0.1	°C	7.2
P433	Section 2 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0
P435	Sect 2 Split Press	-3.4 - 180	0.1	Bar	15.2
P437	Sect 2 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P441	Sect 2 Heat reclaim	0 = Off, 1 = On 2 = On Rly	1	-	0
P474	Sect 2 Ext Trgt	-3.4 - 180	0.1	°C	14.7



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P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P494	Dual Standby See Standby Mode	0 = Off, 1 = On	1	-	1
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					

* Span and Offset allows for the full range of the transducer to be used by the controller.

Span is the full range of the transducer

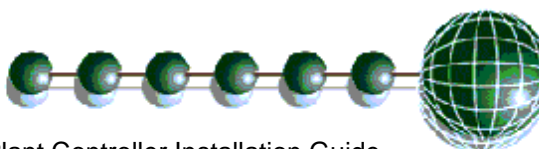
Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar
Span would be 190 (13 bar)
Offset would be -15 (-1 bar)



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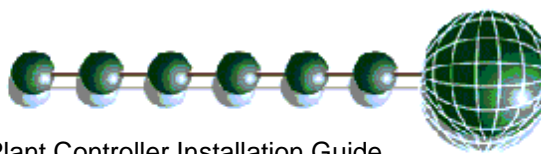


Parameter table for Condenser Controller (Type 10, Staged)

Number	Parameter	Range	Step	Units	Default
P-01	Transducer 1 Span *	-3.4 - 180	0.1	Bar	34.4
P-02	Transducer 1 Offset	-3.4 - 180	0.1	Bar	0
P-03	Transducer 2 Span *	-3.4 - 180	0.1	Bar	13.8
P-04	Transducer 2 Offset	-3.4 - 180	0.1	Bar	0
P-05	Transducer 3 Span *	-3.4 - 180	0.1	Bar	13.8
P-06	Transducer 3 Offset	-3.4 - 180	0.1	Bar	0
P-20	Section 1 Target Pressure	-3.4 - 180	0.1	Bar	2.1
P-21	Section 1 Target Pressure Above P-20	-3.4 - 180	0.1	Bar	0.5
P-22	Section 1 Target Pressure Below P-20	-3.4 - 180	0.1	Bar	0.5
P-23	Section 1 Number of Stages	0 -12	1	-	0
P-24	Section 1 Stage-on Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-25	Section 1 Stage-off Delay	00:00 – 99:00	00:01	mins/sec	00:10
P-26	Section 1 Inverter	0 = Off, 1 = On	1	-	0
P442	Section 1 INV Bypass	0 = Disabled 1 = 1 + no retries 2 = 1 + 1 retry 3 = 1 + 2 retries 4 = 1 + 3 retries 5 = 1 + 4 retries	1	-	0
P444	Section 1 INV Minimum	0 - 100	1	%	0
P446	Section 1 INV Maximum	0 - 100	1	%	100
P-27	Section 1 Response On Speed	1 - 60	1	-	5
P-28	Section 1 Response Off Speed	1 - 60	1	-	5
P-30	Section 1 Alarm Delay	00:00 – 99:00	01:00	mins/sec	05:00
P-31	Section 1 HP Alarm	-3.4 - 180	0.1	Bar	4.1
P-32	Section 1 LP Alarm	-3.4 - 180	0.1	Bar	0.6
P-33	Section 1 LP Shut-down	-3.4 - 180	0.1	Bar	0.4
P-34	Section 1 Low Alarm	00:00 – 99:00	01:00	mins/sec	00:00
P448	Section 1 Fail	0 = Off, 1 = On	1	-	0
P400	Section 1 Sticky Fans	0 - 12	1	-	0
P401	Section 1 Night Set Back	0 = Off 1 = On 2 = Local 3 = Remote	1	-	0
P402	Section 1 Night Reduction	0 - 100	1	%	30
P403	Section 1 Night Set Back On Time	00:00 – 23:59	00:01	mins/sec	20:00
P404	Section 1 Night Set Back Off Time	00:00 – 23:59	00:01	mins/sec	08:00
P405	Section 1 Night Set Back Pressure Limit	-3.4 - 180	0.1	Bar	25
P406	Section 1 Day Reduction	0 - 100	1	%	25
P407	Section 1 Day Pressure Limit	-3.4 - 180	0.1	Bar	25
P408	Section 1 Transducer fail Level	0 - 100	1	%	45
P409	Section 1 Control Type	0 = Fixed 1 = Floating 2 = Float Drop	1	-	0
P410	Section 1 Float Select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5	1	-	0



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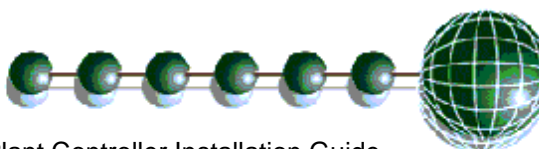


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		5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			
P411	Section 1 Drop select	0 = Probe 1 1 = Probe 2 2 = Probe 3 3 = Probe 4 4 = Probe 5 5 = Probe 6 6 = Probe 7 7 = Probe 8 8 = Remote			
P414	Section 1 Pressure at 0°C/32°F	-3.4 - 180	0.1	Bar	6.0
P415	Section 1 Pressure at 10°C/50°F	-3.4 - 180	0.1	Bar	8.2
P416	Section 1 Pressure at 20°C/68°F	-3.4 - 180	0.1	Bar	10.9
P417	Section 1 Pressure at 30°C/86°F	-3.4 - 180	0.1	Bar	14.2
P418	Section 1 Pressure at 40°C/104°F	-3.4 - 180	0.1	Bar	18.1
P419	Section 1 Pressure at 50°C/122°F	-3.4 - 180	0.1	Bar	23.0
P420	Section 1 Low Limit	-3.4 - 180	0.1	Bar	8.2
P421	Section 1 High Limit	-3.4 - 180	0.1	Bar	23.0
P422	Section 1 Condenser offset	0 - 20	0.1	°C	6
P438	Section 1 Split	0 = Off, 1 = On	1	-	0
P430	Section 1 Split Temp	-60.0 – 128.0	0.1	°C	7.2
P432	Section 1 Split Temp Diff	0.0 – 10.0	0.1	°C	2.0
P434	Sect 1 Split Press	-3.4 - 180	0.1	Bar	15.2
P436	Sect 1 Split Press Diff	-3.4 - 180	0.1	Bar	1.4
P440	Sect 1 Heat reclaim	0 = Off, 1 = On 2 = On Rly	1	-	0
P473	Section 1 Ext trgt	-3.4 - 180	0.1	Bar	14.7
P-60	Status fault Delay	00:00 – 60:00	00:01	mins/sec	00:10
P-61	General Alarm Delay	00:00 – 60:00	00:01	mins/sec	00:10
P480	Liquid Level	0 = Off, 1 = On	1	-	0
P481	High Liquid Level	0 - 100	1	%	80
P482	Low Liquid Level	0 - 100	1	%	20
P483	Liquid Level Alarm Delay	00:00 – 99:00	01:00	mins:sec	05:00
P-80	Status Fault 1	(0) Unused (1) Comp N/O (2) Comp N/C (3) Cond N/O (4) Cond N/C (5) Gen N/O (6) Gen N/C (7) Standby 1 N/O (8) Standby 1 N/C (9) Standby 2 N/O (10) Standby 2 N/C (11) Run 1 N/O (12) Run 1 N/C (13) Run 2 N/O (14) Run 2 N/C (15) INV N/O (16) INV N/C	1	-	0
P-91	Status Fault 12				
dFLt	Restore Default Settings (Front panel Only)				
ESc					



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* Span and Offset allows for the full range of the transducer to be used by the controller.

Span is the full range of the transducer

Offset is the value below zero.

Note. The controller uses absolute pressure; if gauge pressure is required, add +1 Bar to the offset value.

Example: Danfoss AKS 33 with range: -1 bar to 12 bar

Span would be 190 (13 bar)

Offset would be -15 (-1 bar)

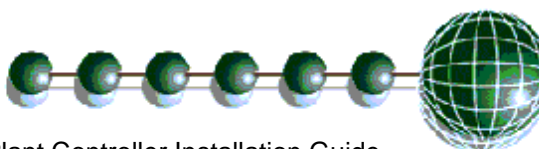
If only transducer input 1 in use please see [Note 10](#) also.

Parameter Description:

Number	Parameter	Description
P-01/03/05	Transducer 1/2/3 Span	Range of the transducers
P-02/04/06	Transducer 1/2/3 Offset	Transducer value below zero.
P-20/40	Target Pressure	Pressure target, control will try to maintain this pressure
P473/474	External Target Pressure	Pressure target when Sect1 Run/Sect2 Run is off. Control will try to maintain this pressure until Sect1 Run/Sect2 Run is on. At this point P-20/40 used. Please see Status Inputs
P-21/41	Target Pressure Above P-20	Set-point above the target, used to obtain a "dead-band"
P-22/42	Target Pressure Below P-20	Set-point below the target, used to obtain a "dead-band"
P-23/43	Number of Stages	Number of stages in the system
P-23/43Fzy	Starts per hour	Limits a compressor to this many starts per hour
P-24/44Fzy	Run smallest	See explanation under the parameter tables for this parameter Run Smallest
P-24/44Stg	Stage-on Delay	Delay time between stages on (Staged types only)
P-25/45Stg	Stage-off Delay	Delay time between stages off (Staged types only)
P-26/46	Inverter	Enables the inverter analogue output and associated relay.
P442/443	Inverter Bypass	Enable for Inverter Bypass feature. See INV Bypass
P444/445	Inverter Min	The minimum percentage the inverter will operate to when Inverter Bypass parameter (P-442/443) is on e.g. if set to 25% the inverter output will never go below this value
P446/447	Inverter Max	The maximum percentage the inverter will operate to when Inverter Bypass parameter (P-442/443) is on e.g. if set to 80% the inverter output will never go above this value
P490/491	Section 1/2 Gas Dump	Enables Gas Dump feature.
P492/493	Section 1/2 Gas Diff	Diff below the set point that the Gas Dump valve is opened. See Gas Dump
P470/471	Always run last	Keeps the last stage running except for a Low Shutdown condition. If the last stage is an inverter, the inverter enable will stay energised, but the inverter analogue output may well decrease to 0% if pressure is below the set-point.
P495/497	Sect 1 / 2 Compressor Unload	Selects the order the compressor loaders are switched off See: Compressor Loaders
P496/498	Sect 1 / 2 Equal	Equalises compressor run times. See: Equal run Times
P-27/47	Response On Speed	Allows the user to speed up/slow down the stage on speed (Option: - 1 to 60 with 60 being fastest response) Note: This parameter applies to the inverter output only when using any of the Staged types.



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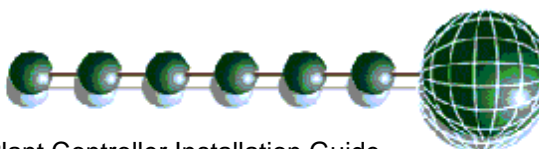


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P-28/48	Response Off Speed	Allows the user to speed up/slow down the stage off speed (Option: - 1 to 60 with 60 being fastest response) Note: This parameter applies to the inverter output only when using any of the Staged types.
P-29/49	Optimise Limit	This is an offset that is added to the target pressure when using the Data Manager Energy feature Pack Optimisation. For example if target pressure is 2.1 Bar and Optimise Limit set to 0.5 Bar. The remote optimise command will only be able to optimise the current suction setpoint up to a maximum of 2.6 Bar
P-30/50	Alarm Delay	Delay before HP and LP alarms are signalled
P-31/51	HP Alarm	HP alarm set-point
P-32/52	LP Alarm	LP alarm set-point, stage off when reached
P-33/53	LP Shut-down	LP shut-down set-point, all stages go off when this is reached
P-34/35	Low Alarm	Delay applied before LP Shutdown alarm is generated. Note as soon as the LP Shutdown setpoint is reached any Compressor/Condenser stages, for the associated section, still operating will go off immediately and does not wait for the LP Shutdown alarm to be created.
P448/449	Sect 1 / 2 Fail	The following will occur in the event of pressure transducer fault on Section 1 or 2: – If set to On then all Compressors or Fans will turn On in the event of a transducer failure. If set to Off then all Compressors or Fans will turn Off in the event of a transducer failure.
P400/450	Sticky Fans	Sticky fans operation allows the user to turn the fans off in a way that keeps a number of fans running longer. See Sticky Fans
P401/451	Night Set Back	Turns on the night set back level. Note This feature is intended to be used when all of the fans are controlled by the inverter. If fan relays are selected, they will never come on as the inverter is required to go to 100% before staging the next fan. There are 4 options : - Off : Night Feature is not used. Controller uses what is set in Day Reduction. (P406/456) On : Night Reduction (parameter 402 / 452) is always used Local : Uses times in Night Set On and Night Set Off parameters (P403/453) (P404/454) to determine Day / Night Remote : Uses GP Timer to determine Day / Night Set up a Gp Timer channel with Output Type set to General. Output mask is the controller name as it appears in the device list. For Output channel number you would count down from 1 st output (Relay 1) starting at 0, 1, 2 etc till you get to output for Night Setback. Tick the Invert box so the night setback is on when channel is off.
P402/452	Night Reduction	Reduces inverter output by this amount during night settings.
P403/453	Night Set Back On Time	Time for the night set back feature to operate
P404/454	Night Set Back Off Time	Time for the night set back feature to go off
P405/455	Night Set Back Pressure Limit	Pressure set-point to disable the night set back feature. Night set back is disabled above this level and enabled below it.



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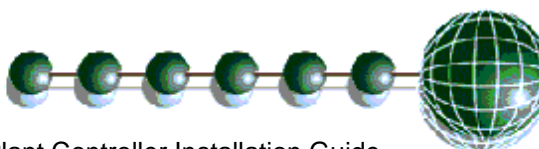


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P406/456	Day Reduction	Reduces the inverter output by this amount when the timer is not in its night zone.
P407/457	Day Pressure Limit	Pressure set-point to disable the day reduction feature. Day reduction is disabled above this level and enabled below it.
P408/458	Transducer fail Level	Sets the output level of the inverter if the transducer fails
P409/459	Control Type	<p>Selects between Fixed, Floating or Drop Leg control for Condenser control only.</p> <p>Fixed uses the set-point parameter as its target (P-20/40) with the corresponding pressure transducer.</p> <p>Floating uses the temperature of a selected probe converted to a pressure as the set-point along with the corresponding pressure transducer.</p> <p>Drop leg uses the temperature of probe mounted on the drop leg to calculate control pressure and uses the set-point parameter as its target (P-20/40).</p>
P410/460	Float Select	<p>Selects the probe that measures the “floating” temperature (Note : This would be fitted to the Air On of the Condenser)</p> <p>See Note Floating Head Pressure</p>
P411/412	Sect 1 / 2 drop Select	Selects which probe is used to measure Drop Leg temperature. See Note Drop Leg
P414/461	Pressure at 0°C	Used to program the temperature to pressure conversion for floating pressure use.
P415/462	Pressure at 10°C	Used to program the temperature to pressure conversion for floating pressure use.
P415/463	Pressure at 20°C	Used to program the temperature to pressure conversion for floating pressure use.
P417/464	Pressure at 30°C	Used to program the temperature to pressure conversion for floating pressure use.
P418/465	Pressure at 40°C	Used to program the temperature to pressure conversion for floating pressure use.
P419/466	Pressure at 50°C	Used to program the temperature to pressure conversion for floating pressure use.
P420/467	Low Limit	Stops the floating pressure target from going below this level
P421/468	High Limit	Stops the floating pressure target from going above this level
P422/469	Condenser offset	Used to set a condenser differential, which is added to the incoming temperature to produce a “floating” set-point
P438/439	Sect 1 / 2 Split	Set to “On” to enable Condenser Split feature.
P430/431	Sect 1 / 2 Split Temp	If outside ambient air temperature falls to this value then the condenser split relay will come on. Note the Condenser Float temperature probe is used as the air temperature reference.
P432/433	Sect 1 / 2 Split Temp Diff	Diff above for the split temp feature (P-430/431). If outside ambient air temperature rises above Sect 1/2 Split Temp parameter plus Sect 1/2 Split Temp Diff parameter then the Condenser split relay will go off
P434/435	Sect 1 / 2 Split Pressure	If the discharge pressure rises above this setting then the condenser split relay will be forced off regardless of temperature.
P436/437	Sect 1 / 2 Split Pressure Diff	Diff below parameter for Split Pressure feature (P-434/435). If the pressure for Section 1/2 falls below Sect 1/2 Split Pressure setpoint plus Sect 1/2 Split Pressure Diff parameter then the condenser split relay will return to normal operation (status depends on P-430/431).
P440/441	Sect 1 / 2 Heat Reclaim	<p>Enable for Heat Reclaim. See : Relay Outputs</p> <p>0 = Off (Not Used)</p>



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		1 = On (Uses Ext Set Point) 2 = On Rly(Uses Ext Set Point and allocates a Relay)
P475	Discharge trip	If Discharge Pressure exceeds this setting All compressors go off immediately and all fans come on immediately. A Discharge Trip Alarm is generated.
P476	Discharge Trip Diff	Diff below for parameter P-475 at which point control goes back to normal and alarm clears.
P472	Run Proof	See section Run-Proof
P-60	Status fault Delay	Time delay before status faults are activated
P-61	General Alarm Delay	Time delay before general faults are activated
P480	Liquid Level	Enable for Liquid Level feature See Note : Liquid Level
P481/482	Liquid Level Alarm	Settings at which High and Low Liquid Level alarms are generated
P483	Liquid Level Alarm Delay	Delay applied before the Low or High liquid alarm is generated.
P494	Dual Standby	Used to place two sections into Standby from one Standby status input. (Note "Std 1 N/O or Std 1 N/C must be utilised when using this feature) See Note Standby Mode
P-80 ↓ P-91	Status Fault 1 ↓ Status Fault 12	Used to select the type of input required
P100/140 Fuzzy ↓ P111/151 Fuzzy	Stage 1 ↓ Stage 12	Select the output device for this stage
P120/160 Fuzzy ↓ P131/171 Fuzzy	Stage 1 Size ↓ Stage 12 Size	Sets the relative size for each compressor
Parameters for Staged type	Stage 1 Relay 1 to 12 ↓ Stage 12 Relay 1 to 12	Maps compressor relays to stages

Liquid Level

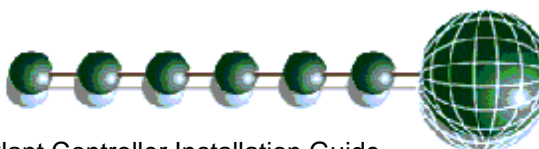
Liquid Level Detector uses 4-20mA Input 3 on the Plant controller. Where 4mA will give a reading of 0% and 20mA will give a reading of 100%. The Span and Offset parameters for Transducer input 3 do not require adjustment and can be left at the default values. "Low Liquid Level Alarm" (P-482) and "High Liquid Level Alarm" (P-481) can be generated. The alarm has a settable delay.

Run-Proof

This is a "global" parameter if set to on the Status fault inputs are used to prove that compressors are running. Configure the status inputs, using either Compressor Normally Closed or Compressor Normally Open, that correspond with each relay output. When the relay output is energised and the run proof signal isn't returned within the specified time period, then the compressor relay will go off and be taken out of the control strategy until the run proof has been reset. The run-proof feature uses the status fault delay (P-60) and all run proof signals must be returned within this delay period. Run proofs are used with compressor (Comp) stages only. This feature can be used in both Fuzzy and Staged applications.



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To reset the run proof for any stage, after maintenance, and return a compressor back into the control strategy use the menu item [Override](#). The override option is used to manually turn on the compressor output. If the proof signal is returned within the allotted time delay the compressor is allocated back into the control strategy; if the proof isn't returned the compressor relay will go off and remain out of the control strategy.

Alternatively the alarm can be cleared remotely by changing parameter P472 from 1 to 0 (On to Off). This clears **all** run proof alarms on **all** compressors which are currently out of the control logic due to run proof feature. Now change P472 from 0 to 1 (Off to On). The compressor(s) will then be available for selection by the control logic. If the compressor is selected by the control strategy and the run proof signal is then not returned within the allotted time delay then it will fail and will be removed from the control logic again.

Gas Dump

Gas Dump Enable (P-490/491). In Fuzzy pack control the Gas dump relay will come on when the Suction Pressure drops below the Set Point (P-20/40) plus the Gas Diff (P-492/493) and all but the last compressor has turned off.

When an Inverter output is configured using Fuzzy pack control the Gas dump relay will come on only when the Inverter is active, i.e. above 0% and all other Compressors configured in that section are off.

With Staged pack control the Gas Dump relay will come on only when last compressor is running.

The Gas dump relay will go off again when: -

The pressure rises above the Set Point (P-20/40)

Or

When the last stage compressor goes off, or Inverter Enable is turned off.

Compressor Loaders

Parameters P495/496 determines the order in which the compressor loaders are switched off.

This gives the option to turn off one compressor and its loaders before turning off the next compressor, or to switch off all the loaders first leaving compressors running unloaded.

If P495/496 is set to 0 (Off) then a compressor's loaders and body will be switched off before any other compressor loader is switched off.

If P495/496 set to 1 (On) then all loaders on all compressors will be switched off before any compressor body is switched off.

Example 1 (Type 1 Fuzzy)

Pack set up: 2 compressors with 2 Loaders each

Sect 1 stage 1 = Comp.

Sect 1 stage 2 = Loader.

Sect 1 stage 3 = Loader.

Sect 1 stage 4 = Comp.

Sect 1 stage 5 = Loader.

Sect 1 stage 6 = Loader.

Parameter P495 = 0 (Off)

Switching On sequence: Pressure above set point + diff

First compressor comes on. Compressor loader 1 comes on. Compressor loader 2 comes on.

Second compressor comes on. Compressor loader 1 comes on. Compressor loader 2 comes on.

Switching Off sequence: Pressure below set point – diff

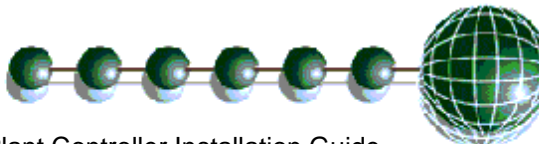
One compressor loader 2 goes off. Compressor loader 1 goes off. Compressor body goes off.

Next compressor loader 2 goes off. Compressor loader 1 goes off. Compressor body goes off.

This configuration switches off one compressor and its loaders before switching off the next compressor loader. Thus leaving one compressor fully loaded until the first one is completely off.



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Example 2 (Type 1 Fuzzy)

Pack set up: 2 compressors with 2 Loaders each

Sect 1 stage 1 = Comp.

Sect 1 stage 2 = Loader.

Sect 1 stage 3 = Loader.

Sect 1 stage 4 = Comp.

Sect 1 stage 5 = Loader.

Sect 1 stage 6 = Loader.

Parameter P495 = 1 (On)

Switching On sequence: Pressure above set point + diff

First compressor comes on. First compressor loader 1 comes on. First compressor loader 2 comes on.

Second compressor comes on. Second compressor loader 1 comes on. Second compressor loader 2 comes on.

Switching Off sequence: Pressure below set point – diff

One compressor loader 2 goes off. Compressor loader 1 goes off.

Next compressor loader 2 goes off. Compressor loader 1 goes off.

One compressor body goes off. Next compressor body goes off.

This configuration switches off all loaders before switching off any compressor, thus leaving both compressors running unloaded before switching one completely off.

NOTE: If using an Inverter with loaders

The Inverter and its loader/s will always be the last to go off.

Equal Run Times

With parameters P496/498 Set to 1 (On) the controller will bring on the compressors in a way that the running times are as near equal as possible.

If the pressure is above set point, the next compressor that comes on will be the compressor that has been running for the least amount of time.

If the pressure is below set point the next compressor to go off will be the one that has been running the longest.

This configuration, over time, will make all the compressor run hours as equal as possible.

Inverter Bypass

Inverter Bypass Parameter (442/443) is used to set however many retries are required if the Inverter run signal is not returned in the allocated time after the inverter enable has been turned on.

P442/443 set for 1 to 5 is the number of times enable comes on including initial inverter enable turned on.

0 = Feature disabled.

1 = Inverter enable will come on once with no retries

2 = Initial turn on and 1 retry

3 = Initial turn on and 2 retries

4 = Initial turn on and 3 retries

5 = Initial turn on and 4 retries

Firstly assign the desired inverter run input using the Status Fault inputs. This input can be set as either normally closed (INV N/C) or normally open (INV N/O). When the inverter enable relay is called for by the control strategy then the inverter run signal has to be returned to the appropriate input within 2 seconds.

If the run signal is received then the control strategy will continue as normally and the variable output will begin to ramp up.

If the signal is not returned within the allotted time then the following will occur.

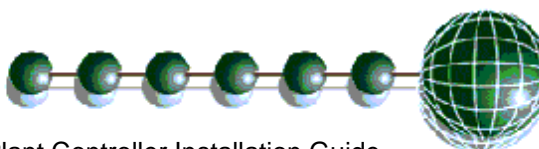
P442/443 set for 1 The inverter enable will stay off and bypass relay will come on.

P442/443 set for 2 to 5 The inverter enable relay will be turned off for a further 15 seconds.

This process will occur a further 1 to 4 retries depending on (P442/443) if the inverter run signal is not received in any test instance. After the retries the inverter will be taken out of the control logic, until the fault is cleared using the reset process, and the pack will operate as a standard digital pack without the use of the inverter output. At this point the Bypass relay will become like another staged relay and will cycle on and off when called for.



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An "INV Bypass" alarm will be generated.

Note if the inverter run signal is not returned within the allotted time in the first instance but is successful in the second, third or fourth attempt (Depending on (P442/443) then any future inverter run tests must still complete all tests.

To reinstate the inverter output, once the fault has been rectified, either reset the Plant controller or by using the [Override](#) feature force the relay associated to the inverter on.

The status inputs should be mapped to the relay used as the Inverter Enable relay for a given section i.e. if relay 1 is the first Inverter relay then status Input 1 would become the inverter run input for Section 1. If the second Inverter relay is 5 then status Input 5 would become the inverter run input for Section 2.

Please see [Relay Outputs – Configuration](#).

Relay Run Hours

The total run hours for each relay can be viewed via a Laptop/PC or from the Data Manager frontend. This feature informs the user of the total number of hours a given relay has been on. Therefore if a compressor is assigned to a relay the total run hours for the compressor can be viewed. To reset the run hours for any given relay connect to the Plant controller using a PC/Laptop. Login and click on the configuration link. Entering 0 into anyone of the relay hour fields and pressing the set configuration button will reset the run hours for that relay back to 0. Run hours apply to all relays including the Alarm relay.

Relay Starts

The total number starts for each relay can be viewed via a Laptop/PC or from the Data Manager frontend. This feature informs the user of the total number of starts for a given relay. Therefore if a compressor is assigned to a relay the total number of starts for that compressor can be viewed. To reset the relay starts count for a given relay connect to the Plant controller using a PC/Laptop. Login and click on the configuration link. Entering 0 into anyone of the relay start fields and pressing the set configuration button will reset the count for that relay back to 0. Relay starts apply to all relays including the Alarm relay.

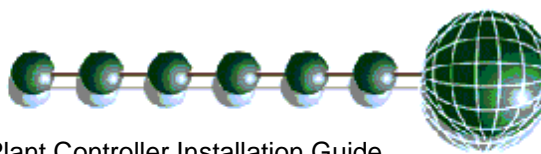
Setup via a PC

Log on to the RDM web site and go to Support -> Software.

Download the following folder: - Plant Controller USB drivers for Windows XP/2000. Contained within this folder are installation instructions and the drivers required to connect to the Mercury Plant controller. A USB cable is required which connects to a Type A USB connector (PC) at one end and a Type B USB connector at the other end (Plant USB Device port).



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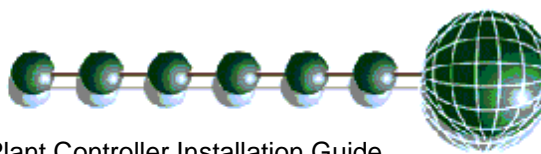
Plant Controller home page

Log in using an appropriate username and password; setup operations can then be used via the PC by clicking on the appropriate link: -

Link	Operation
Values	Shows the values being return on the controllers inputs and outputs
Settings	Shows the controllers parameter settings
Alarm Log	Shows the controllers alarm history; up to 1000 alarms are stored
Graph	Shows the controller values in graphical format
Set Parameters	Allows the user to change parameter values; see Set Parameters
System Log	Shows the changes made to the controller in chronological order
Network	Allows the user to setup: - IP Address Netmask Gateway
Time	Allows the user to set the Time or synchronise with the PC
Reset	Allows the user to reset the controller
Configuration	Allows the user to change the controller configuration; see changing configuration
Export Log	Creates a log file of the controllers data for downloading onto a PC
Save Pack Setup	Saves the current Configuration
Load pack Setup	Allows the user to upload a pre-configuration (a stand-alone PC program is available to create Plant controller configuration files. Contact RDM for details)
Clear Alarm Log	Clears the controller alarm log completely (Yes/No choice)
Version	Shows the controllers software version



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Mercury Plant Controller Installation Guide

Change Configuration (PC)

This page allows the user to change the configuration of the Pack controller: - 1 example as follows:-

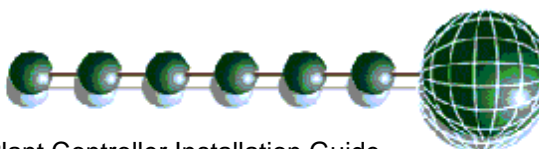
Configuration	Value	Unit
Control Type	DualPack Fuzz	
Probe Type	PT1000C	
UniiO 1	4-20mA_I	
UniiO 2	4-20mA_I	
UniiO 3	4-20mA_I	
UniiO 4	4-20mA_O	
UniiO 5	4-20mA_O	
UniiO 6	4-20mA_I	
UniiO 7	4-20mA_I	
UniiO 8	4-20mA_I	
Status Type	0V	
Broadcast	Off	
Probe 1 Offset	0.0	°C
Probe 2 Offset	0.0	°C
Probe 3 Offset	0.0	°C
Probe 4 Offset	0.0	°C
Probe 5 Offset	0.0	°C
Probe 6 Offset	0.0	°C
Probe 7 Offset	0.0	°C
Probe 8 Offset	0.0	°C
IP 1	10	
IP 2	2	
IP 3	2	
IP 4	92	
nL	24	
Gt 1	0	
Gt 2	0	
Gt 3	0	
Gt 4	0	

Change Parameters (PC)

Parameter	Value	Unit
Trans1 Span	13.8	bar
Trans1 Offset	0.0	bar
Trans2 Span	13.8	bar
Trans2 Offset	0.0	bar
Trans3 Span	13.8	bar
Trans3 Offset	0.0	bar
Sec1 Trgt	2.1	bar
Sec1 Ext Trgt	3.1	bar
Sec1 Trgt Above	0.5	bar
Sec1 Trgt Below	0.5	bar
Sec1 Stages	0	
Sec1 Stg On Dly	00:10	mm:ss
Sec1 Stg Off Dly	00:10	mm:ss
Sec1 Inv	Off	
Sec1 Always Run Last	Off	
Sec1 Resp On	5	



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Configuration of inputs and outputs:

Status Inputs

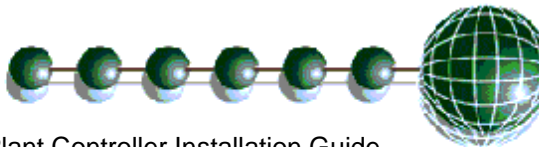
Section Inputs can be set up as: -

0	Unused	Input is not used
1	Compressor Normally Open	When selected "Make" to generate Compressor Fault
2	Compressor Normally Closed	When selected "Break" to generate Compressor Fault
3	Condenser Normally Open	When selected "Make" to generate Condenser Fault
4	Condenser Normally Closed	When selected "Break" to generate Condenser Fault
5	General Normally Open	When selected "Make" to generate General Fault
6	General Normally Closed	When selected "Break" to generate General Fault
7	Standby 1 Normally Open	When selected "Make" to place Section 1 into standby and generate Standby alarm.
8	Standby 1 Normally Closed	When selected "Break" to place Section 1 into standby and generate Standby alarm.
9	Standby 2 Normally Open	When selected "Make" to place Section 2 into standby and generate Standby alarm.
10	Standby 2 Normally Closed	When selected "Break" to place Section 2 into standby and generate Standby alarm.
11	Run 1 Normally Open	When selected "Break" to use Sect 1 Ext Target (P473) OR "Rem Ext 1" See note : Ext Target
12	Run 1 Normally Closed	When selected "Make" input to use Sect 1 Ext Target (P473) OR "Rem Ext 1" See note : Ext Target
13	Run 2 Normally Open	When selected "Break" input to use Sect 2 Ext Target (P474) OR "Rem Ext 2" See Note : Ext Target
14	Run 2 Normally Closed	When selected "Make" input to use Sect 2 Ext Target (P474) OR "Rem Ext 2" See note : Ext Target
15	INV N/O	When selected "Break" to signal Inverter Run. See Note : INV Bypass
16	INV N/C	When selected "Make" to signal Inverter Run. See Note : INV Bypass

For the above any alarms will be generated after the Status Fault Delay (P-60) has timed out. Note Standby Alarm follows the General Fault Delay (P-60)



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External Target

Pack Controller

To use Sect 1/2 Ext Target (P473/474) instead of Section 1/2 Target Pressure (P-20/40) a status Input must be set to "Run 1/2 N/O or N/C".

- When the input is activated the Target Pressure will change from (P-20/40) to (P473/474)
- When the input is de-activated the Target Pressure will revert back to (P-20/40)

Condenser Controller

Heat Reclaim must be set to "On" or "On/Rly".

To use Sect 1/2 Ext Target (P473/474) instead of Section 1/2 Target Pressure (P-20/40) a Status Input must be set to "Run 1/2 N/O or N/C".

With Heat Reclaim parameter (P440/441) set to "On" the following will occur: -

- When the input is activated the Target Pressure will change from (P-20/40) to (P473/474)
- When the input is de-activated the Target Pressure will revert back to (P-20/40)

Or

With Heat Reclaim parameter (P440/441) set to "On/Rly" the following will occur: -

- When input is activated the Target Pressure will change from (P-20/40) to (P473/474) and turn on the Heat Reclaim relay output.
- When input is de-activated the Target Pressure will revert back to (P-20/40) and turn off the Heat Reclaim relay output.

Remote TDB Command

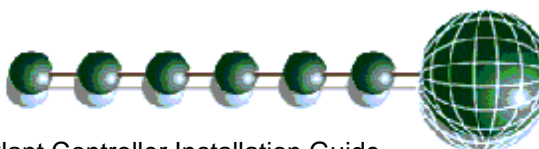
To use a Remote Ext Target Set Point sent from a Data Manager TDB Program Instead of the value entered for the Ext Target setpoint (P473/474), for a Pack or Condenser, then the following must be configured: -

- Status Input must be set to "Run 1/2 N/O or N/C" and if required the above for Heat Reclaim has to be set (P440/441) to either "On" or "On/Rly".
- When input is activated the Target Pressure will change from (P-20/40) to whatever Target Pressure is being sent from TDB program. The settable range for "Rem Ext 1/2" is -3.4 Bar to 150 Bar.
- When input is de-activated the Target Pressure will revert back to (P-20/40)

Send Ext Target Set Point Command to "Rem Ext 1"/ "Rem Ext 2" using a Data Manager TDB program. Analogue Output block.



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Relay Outputs – Configuration

Compressor(s)/Loader(s)/Fan(s) relays are assigned using the Stage parameters for a given section.

Additional relay outputs for a section will be assigned in the following order once the Stage parameters have been configured. The following will be assigned to the first available relay(s): -

Condenser Split
Heat Reclaim
INV Bypass
Gas Dump

The first available relay after Section 1 and 2 are configured will become the Alarm Relay

Section Stages

Stage	Description	
None	Use this option to end the number of stages in the controller	See note 7
Unused	Use this option to skip a relay output within a stage	
Comp	Use this option to assign a relay output to a compressor	See note 5
Loader	Use this option to assign a relay output to a compressor loader	See note 9
Fan	Use this option to assign a relay to a fan	
Inverter	Use this option to assign a relay to an Inverter	
Trim	Use this option to set a relay to a trim compressor	See note 6
Comp Run	Use this option to set a relay as a separate compressor used only when other compressors are running	See note 8

Note 5: In a pack configuration, at least 1 output must be assigned to a compressor. Loader outputs will not energise without a compressor being on. When assigning stages a Loader should follow the Compressor on which it is mounted.

Note 6. This option can be used to delay the onset of the inverter output, all outputs selected as “Trim” will come on before the Inverter output energises. Once all the trim stages are on the inverter enable relay would be energised and the inverter analogue output would begin to ramp up. The trim stages would remain on until all other stages and the inverter are turned off.

Note 8: This option is used to bring on a separate compressor. This output is active when any of the other defined compressors (Comp stages) are running. This output is off when the last compressor in its section is turned off. Note if only the inverter output is configured and no other Comp stages then the Comp Run is active when the inverter output is active.

Note 9 : Relays can be configured as Loaders, selected after a Compressor stage or a Compressor running on an Inverter

Alarm Relay

Note 7. The alarm relay is assigned automatically to the first free relay that has been assigned “None” in the stage programming. At first power on this is likely to be relay 1, until programming of the output stage is complete. The relay is energised with no alarm and de-energised when in alarm.

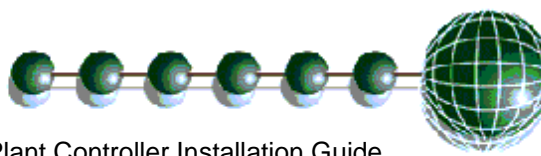
Stage Sizes

Stage sizes will determine the order in which compressors or loaders are switched on and off. This is a relative number between 0 and 60, reflecting the size of the compressor (usually horse power)

The default stage size is 0; stage sizes must be entered for correct operation.



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Operation (Fuzzy)

Once the controller has been set-up and configured, normal operation will resume. If the appropriate Type has been selected the controller will operate using a “fuzzy logic” based control algorithm. The controller will determine the stages to bring on and off using the fuzzy logic rules and adhering to the starts/hr criteria. The response time for devices switching on and off can be varied by adjusting the response on and response off parameters (1 is the slowest response, 60 is the quickest). The fuzzy logic will attempt to optimise the compressor starts and keep them at a minimum. Before a compressor or fan is switched on, Relay 1 will energise and the variable output will ramp to 100%, when it reaches this point, the fixed device (compressor, loader or fan); will switch on and the variable output will begin its cycle again starting from 0%. When demand is satisfied, and all compressor relays are off, the variable output ramps down 0%, if demand is still satisfied, the enable relay de-energises.

Operation (Staged)

Staged operation requires the output relays to be “mapped” to a particular stage. Each stage (there are 12 stages) has to have at least 1 relay assigned for the controller to operate correctly. More than one relay can be assigned to stages in a given section and the same relay can be used in multiple stages. Note a relay cannot be assigned in both Section 1 and Section 2. As the pressure rises above the target setpoint, plus the target above value, the controller will enter Stage 1 after the stage on delay has expired. At this point any relay assigned in Stage 1 will come on and the stage on delay timer will be reset. If the pressure remains above the setpoint, plus the target above value, and the stage on delay has expired for a second time the controller will enter stage 2. At this point any relay assigned in Stage 2 will come on. Note if a relay has been assigned in Stage 1 but not used in Stage 2 then it will go off at this point. The reverse occurs when the pressure falls below the setpoint plus the target below value. The controller will step down the stages using the stage off delay (P-25) until all stages are off.

When using a variable output as the pressure rises above target setpoint, plus target above, the variable speed output will ramp up from 0% to 100% without following the stage on delay. If the pressure stays above the target setpoint and the variable output is at 100% and the stage on delay has timed out then the controller will enter Stage 1. At this point the variable output will reset to 0% and start ramping up again towards 100%. If the pressure stays above the target setpoint and the variable output is at 100% and the stage on delay has timed out then the controller will enter Stage 2. As the pressure drops below the setpoint, minus the target below, the variable output will ramp from 100% down to 0%, once the stage off delay expires the controller will stage down. Note if the variable output reaches 100% and the stage on delay has not expired the output will remain at 100% until the stage on delay has expired.

For example if set to dual Pack and pack 1 has 4 Compressors the following could be set: -

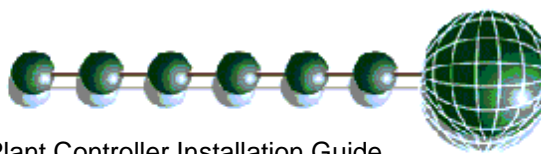
Sect1 Stg1 : Rly 1 =On, **Sect1 Stg2** : Rly 1 and Rly 2 = On, **Sect1 Stg 3** : Rly 1 ,Rly 2 and Rly 3 = On. **Sect1 Stg 4** : Rly 1, Rly 2, Rly 3 and Rly 4 = On. This would stage relay 1 through to four on after the appropriate stage delay if the pressure is above the target setpoint and differentials.

Pack 2 would start as follows:-

Sect2 stg1: Rly 5 = On (**Note**: Starting at Relay 5 as the first 4 relays have already been allocated to Pack 1)



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Other operational features

Floating Head Pressure

When the condenser controller is used in the “Floating Head pressure” mode, the temperature to pressure parameters must be used to profile a pressure curve from the air on temperature probe for the condenser (P414 to P419 and P461 to P466). The value read from the temperature probe is added to a “Condenser Offset” (P422) and then converted to a pressure. This converted pressure replaces the “Target Setpoint” (P01) as the target pressure and P01 is only used as a default; for instance when the probe is disconnected or develops a fault. Low and high pressure levels allow for a lower and upper limit to be set for the pressure range.

The air on temperature can be read from probe inputs 1 to 8 and is settable via parameter P-410/P-460. The float temperature can also be received as a TDB command sent from a Data Manager TDB program. This would allow for a single probe temperate to be shared with multiple Plant controllers. Please see the relevant Data Builder user guide with regards to creating a TDB program. The following commands would be used in TDB to send the temperature data to the Plant controller. If P-410 is set to Remote then “S1 Rem Float” would be used in TDB to send the remote temperature used for Section 1 condenser float or if P-460 is set to Remote then “S2 Rem Float” would be used in TDB to send the remote temperature used for Section 2 condenser float.

Drop Leg

When the condenser is used in the “Drop Leg” mode, the temperature measured from the condenser Drop Leg is converted to a pressure. This converted pressure replaces the condenser pressure transducer and is used in the control strategy. If the drop leg temperature is lost then the control strategy will revert to using the relevant pressure transducer.

Drop Leg temperature can be read from probe inputs 1 to 8 or set to remote then read from another pack which is reading the Drop Leg Temperature and sending temperature via a TDB Program to Input “S1 Rem Drop Leg” or “S2 Rem Drop Leg”. This is then converted to a pressure and used as Control Pressure

Drop Leg temperature can be read from probe inputs 1 to 8 and is settable via parameter P-41/P-412. The drop leg temperature can also be received as a TDB command sent from a Data Manager TDB program. Please see the relevant Data Builder user guide with regards to creating a TDB program. The following commands would be used in TDB to send the temperature data to the Plant controller. “S1 Rem Float” would be used in TDB to send the remote temperature used for Section 1 condenser drop leg or “S2 Rem Float” would be used in TDB to send the remote temperature used for Section 2 condenser drop leg.

Night Set-back

This controller; when in condenser mode has a “Night Set-back” feature for the condenser controller. The variable output can be set to reduce to a pre-determined level; either by an internal timer, or by times sent to the controller over the network. (Use a GP Timer channel in a data Manager or Data Director)

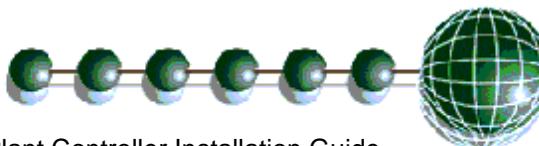
There is a High pressure limit, over which the night set-back feature will be turned off. As the pressure reduces under this limit the night set-back feature is switched on again.

Day Set-back

Similarly, this controller; when in condenser mode has a day Set-Back feature. The Day Set-Back feature uses the local night Set-Back clock, (if it's out of the night set-back time, day set-back will be on) Note: - When Set-Back mode is on, no further fan stages will come on unless the variable output reaches 100%, either by reaching the high pressure point or Set-Back going off. When configured as a condenser controller, loss of the pressure input will result in the variable output going to the value defined in P17.



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Invert Relays

The operation of the relays can be inverted so that N/C contacts can be used for energisation. This can be done from the configure screen on web page. Choose the relay(s) you wish to invert and set them to on. This process can also be completed from the controller display. Navigate to the menu option **rlly** and select the relay output you wish to invert for example **r-05** is relay output 5. Change from "0" to "1" to invert the relay so that the N/C contact is in use.

Please note: This operation does not invert the Alarm relay. The alarm relay is energised when there are no alarms present.

Sticky Fans

Sticky fan operation allows the user to turn the fans off in a way that keeps a number of fans running longer.

Example:

If in a Pack/Condenser configuration fans are mapped to relays 5, 6, 7, 8, 9, and 10; the following sequence will apply if **sticky fans (P450)** is set to 2

	Fan1	Fan2	Fan3	Fan4	Fan5	Fan6
On Sequence	1 st	2 nd	3 rd	4 th	5 th	6 th
Relay #	Relay 5	Relay 6	Relay 7	Relay 8	Relay 9	Relay 10
Off Sequence	6 th	5 th	1 st	2 nd	3 rd	4 th

USB Operation

The following operations can be performed using a memory-stick plugged into the USB port: -

1. Export event log U-01
2. Export logged data U-02
3. Save configuration U-03
4. Load configuration U-04
5. Upgrade the software U-05

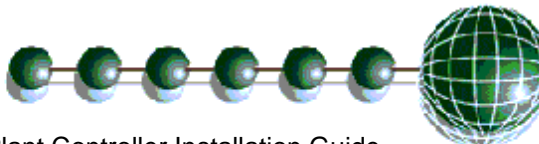
The above requires the user to enter the USB menu via the display and press enter at the appropriate display option.

For example to save the current configuration insert a USB Memory stick into one of the USB Host ports, go to the USB software menu option, press enter, then use the up key to scroll to U-03. Now press enter, the screen will flash "USB" until the operation has completed.

The file is transferred to the memory-stick in .zip format. The USB memory stick must be formatted as FAT32.



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Viewing

Inputs and Outputs

Apart from setting up the controller, you can also view the status of the inputs and outputs.

1. From the function menu, select "IO", press enter
2. You can now scroll through the IO tables as set out below. The tables you view will depend on the controller type configuration.

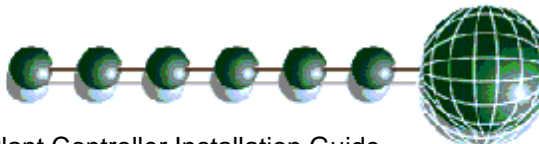
Input/Output Tables

Input/Output table for Pack Controller (Type 1)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-31	Variable Output 1	0 – 100	%
O-41	Optimisation Level	-3.4 - 180	Bar
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-72	Section 1 Gas Dump	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Standby	



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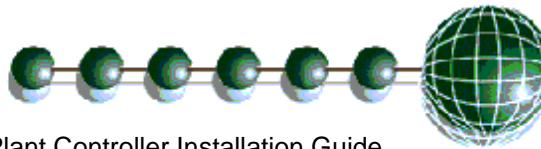


Input/Output table for Dual Pack Controller (Type 2)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused	
I-51	Section 2 Run	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-31	Variable Output 1	0 – 100	%
O-32	Variable Output 2	0 – 100	%
O-41	Optimisation Level Pack 1	-3.4 - 180	Bar
O-42	Optimisation Level Pack 2	-3.4 - 180	Bar
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-71	Sect 2 Bypass	0 = Off, 1 = On	
O-72	Section 1 Gas Dump	0 = Off, 1 = On	
O-73	Section 2 Gas Dump	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	
S-02	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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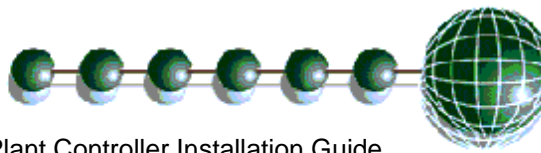


Input/Output table for Pack/Condenser Controller (Type 3)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-21	Sect 2 rem Float	-60 to +128	°C
I-23	Sect 2 Rem drop Leg	-60 to +128	°C
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused	
I-53	Sect 2 Heat	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
I-56	Rem Ext 2	-60 to +128	°C
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-31	Variable Output 1	0 – 100	%
O-32	Variable Output 2	0 – 100	%
O-41	Optimisation Level Pack 1	-3.4 - 180	Bar
O-52	Section 2 Float Pressure	-3.4 - 180	Bar
O-54	Sect 2 Drop LegTemp	-60 to +128	°C
O-56	Sect 2 Drop Leg Press	-3.4 - 180	Bar
O-58	Sect 2 Split	0 = Off, 1 = On	
O-60	Sect 2 Heat Reclaim	0 = Off, 1 = On	
O-62	Section 2 Night Set-back	0 = Off 1 = On	
O-64	Section 2 Day Set-back	0 = Off 1 = On	
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-71	Sect 2 Bypass	0 = Off, 1 = On	
O-72	Section 1 Gas Dump	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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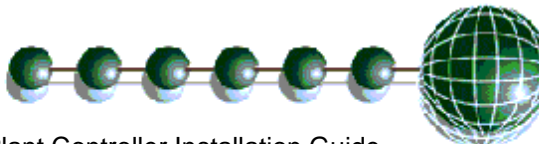


Mercury Plant Controller Installation Guide

S-02	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	
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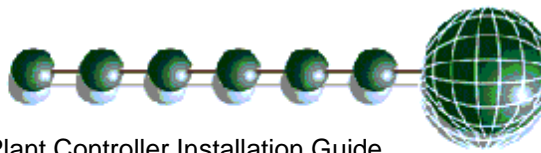


Input/Output table for Dual Condenser Controller (Type 4)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-20	Sect 1 rem float	-60 to +128	°C
I-21	Sect 2 rem Float	-60 to +128	°C
I-22	Sect 1 Rem Drop Leg	-60 to +128	°C
I-23	Sect 2 Rem drop Leg	-60 to +128	°C
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-52	Sect 1 Heat	0 = Off, 1 = On 2 = Unused	
I-53	Sect 2 Heat	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
I-55	Rem Ext 1	-60 to +128	°C
I-56	Rem Ext 2	-60 to +128	°C
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-31	Variable Output 1	0 – 100	%
O-32	Variable Output 2	0 – 100	%
O-51	Section 1 Float Pressure	-3.4 - 180	Bar
O-52	Section 2 Float Pressure	-3.4 - 180	Bar
O-53	Sect 1 Drop Leg Temp	-60 to +128	°C
O-54	Sect 2 Drop LegTemp	-60 to +128	°C
O-55	Sect 1 Drop Leg Press	-3.4 - 180	Bar
O-56	Sect 2 Drop Leg Press	-3.4 - 180	Bar
O-57	Sect 1 Split	0 = Off, 1 = On	
O-58	Sect 2 Split	0 = Off, 1 = On	
O-59	Sect 1 Heat Reclaim	0 = Off, 1 = On	
O-60	Sect 2 Heat Reclaim	0 = Off, 1 = On	
O-61	Section 1 Night Set-back	0 = Off, 1 = On	
O-62	Section 1 Day Set-back	0 = Off, 1 = On	
O-63	Section 2 Night Set-back	0 = Off, 1 = On	
O-64	Section 2 Day Set-back	0 = Off, 1 = On	
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-71	Sect 2 Bypass	0 = Off, 1 = On	



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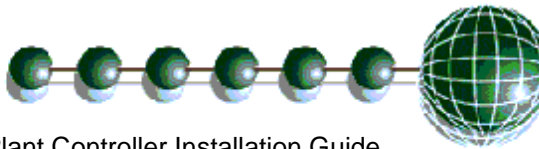


Mercury Plant Controller Installation Guide

S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	
S-02	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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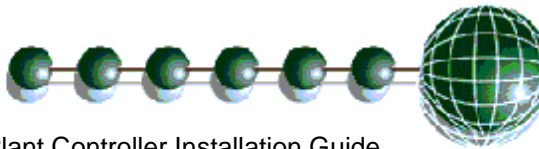


Input/Output table for Condenser Controller (Type 5)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-20	Sect 1 rem float	-60 to +128	°C
I-22	Sect 1 Rem Drop Leg	-60 to +128	°C
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-52	Sect 1 Heat	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
I-55	Rem Ext 1	-60 to +128	°C
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-31	Variable Output 1	0 – 100	%
O-51	Section 1 Float Pressure	-3.4 - 180	Bar
O-53	Sect 1 Drop Leg Temp	-60 to +128	°C
O-55	Sect 1 Drop Leg Press	-3.4 - 180	Bar
O-57	Sect 1 Split	0 = Off, 1 = On	
O-59	Sect 1 Heat Reclaim	0 = Off, 1 = On	
O-61	Section 1 Night Set-back	0 = Off 1 = On	
O-63	Section 1 Day Set-back	0 = Off 1 = On	
O-70	Sect 1 Bypass	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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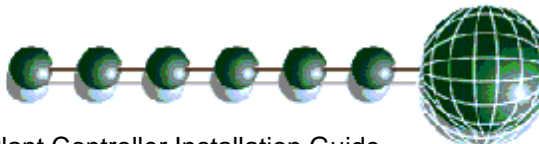


Input/Output table for Pack Controller (Type 6)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-20	Section 1 Stage	0 -12	
O-31	Variable Output 1	0 – 100	%
O-41	Optimisation Level	-3.4 - 180	Bar
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-72	Section 1 Gas Dump	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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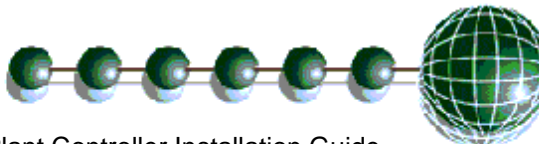


Input/Output table for Dual Pack Controller (Type 7)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused	
I-51	Section 2 Run	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-20	Section 1 Stage	0 – 12	
O-21	Section 2 Stage	0 – 12	
O-31	Variable Output 1	0 – 100	%
O-32	Variable Output 2	0 – 100	%
O-41	Optimisation Level Pack 1	-3.4 - 180	Bar
O-42	Optimisation Level Pack 2	-3.4 - 180	Bar
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-71	Sect 2 Bypass	0 = Off, 1 = On	
O-72	Section 1 Gas Dump	0 = Off, 1 = On	
O-73	Section 2 Gas Dump	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	
S-02	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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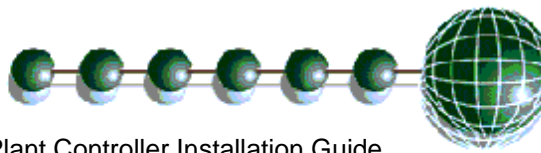


Input/Output table for Pack/Condenser Controller (Type 8)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-21	Sect 2 rem Float	-60 to +128	°C
I-23	Sect 2 Rem drop Leg	-60 to +128	°C
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-50	Section 1 Run	0 = Off, 1 = On 2 = Unused	
I-53	Sect 2 Heat	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
I-56	Rem Ext 2	-60 to +128	°C
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-20	Section 1 Stage	0 – 12	
O-21	Section 2 Stage	0 – 12	
O-31	Variable Output 1	0 – 100	%
O-32	Variable Output 2	0 – 100	%
O-41	Optimisation Level Pack 1	-3.4 - 180	Bar
O-52	Section 2 Float Pressure	-3.4 - 180	Bar
O-54	Sect 2 Drop LegTemp	-60 to +128	°C
O-56	Sect 2 Drop Leg Press	-3.4 - 180	Bar
O-58	Sect 2 Split	0 = Off, 1 = On	
O-60	Sect 2 Heat Reclaim	0 = Off, 1 = On	
O-62	Section 2 Night Set-back	0 = Off, 1 = On	
O-64	Section 2 Day Set-back	0 = Off, 1 = On	
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-71	Sect 2 Bypass	0 = Off, 1 = On	
O-72	Section 1 Gas Dump	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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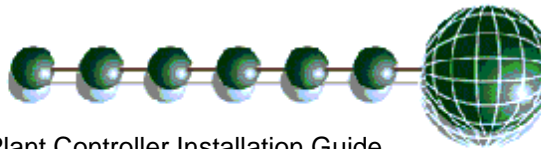


Mercury Plant Controller Installation Guide

S-02	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	
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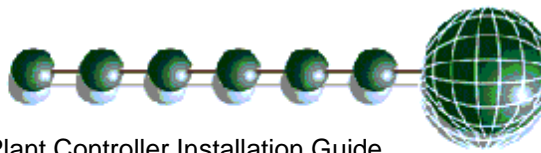


Input/Output table for Dual Condenser Controller (Type 9)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-20	Sect 1 rem float	-60 to +128	°C
I-21	Sect 2 rem Float	-60 to +128	°C
I-22	Sect 1 Rem Drop Leg	-60 to +128	°C
I-23	Sect 2 Rem drop Leg	-60 to +128	°C
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-52	Sect 1 Heat	0 = Off, 1 = On 2 = Unused	
I-53	Sect 2 Heat	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	%
I-55	Rem Ext 1	-60 to +128	°C
I-56	Rem Ext 2	-60 to +128	°C
O-01 ↓	Relay 1 ↓	0 = Off 1 = On	
O-12	Relay 12		
O-20	Section 1 Stage	0 – 12	
O-21	Section 2 Stage	0 – 12	
O-31	Variable Output 1	0 – 100	%
O-32	Variable Output 2	0 – 100	%
O-51	Section 1 Float Pressure	-3.4 - 180	Bar
O-52	Section 2 Float Pressure	-3.4 - 180	Bar
O-53	Sect 1 Drop Leg Temp	-60 to +128	°C
O-54	Sect 2 Drop LegTemp	-60 to +128	°C
O-55	Sect 1 Drop Leg Press	-3.4 - 180	Bar
O-56	Sect 2 Drop Leg Press	-3.4 - 180	Bar
O-57	Sect 1 Split	0 = Off, 1 = On	
O-58	Sect 2 Split	0 = Off, 1 = On	
O-59	Sect 1 Heat Reclaim	0 = Off, 1 = On	
O-60	Sect 2 Heat Reclaim	0 = Off, 1 = On	
O-61	Section 1 Night Set-back	0 = Off, 1 = On	
O-62	Section 1 Day Set-back	0 = Off, 1 = On	
O-63	Section 2 Night Set-back	0 = Off, 1 = On	
O-64	Section 2 Day Set-back	0 = Off, 1 = On	
O-70	Sect 1 Bypass	0 = Off, 1 = On	
O-71	Sect 2 Bypass	0 = Off, 1 = On	



Ensure that all power is switched off before installing or maintaining this product

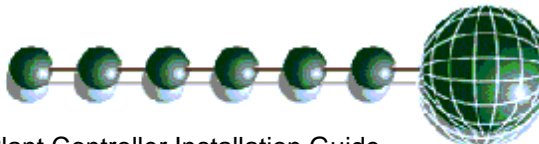


Mercury Plant Controller Installation Guide

S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	
S-02	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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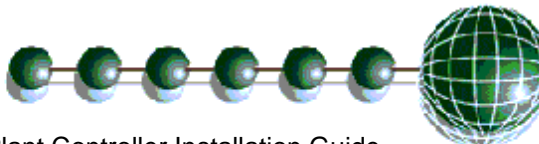


Input/Output table for Condenser Controller (Type 10)

Number	IO	Range	Units
I-01	Pressure Input 1	-3.4 - 180	Bar
I-02	Pressure Input 2	-3.4 - 180	Bar
I-03	Pressure Input 3	-3.4 - 180	Bar
I-10 ↓	Analogue Input 1 ↓	-60 to +128	°C
I-17	Analogue Input 8		
I-20	Sect 1 rem float	-60 to +128	°C
I-22	Sect 1 Rem Drop Leg	-60 to +128	°C
I-30 ↓	Digital Input 1 ↓	0 = OK 1 = Alarm 2 = Unused	
I-41	Digital Input 12		
I-52	Sect 1 Heat	0 = Off, 1 = On 2 = Unused	
I-54	Liquid Level	0 – 100	
I-55	Rem Ext 1	-60 to +128	
O-01 ↓	Relay 1 ↓	0 = Off, 1 = On	
O-12	Relay 12		
O-20	Section 1 Stage	0 – 12	
O-31	Variable Output 1	0 – 100	%
O-51	Section 1 Float Pressure	-3.4 - 180	Bar
O-53	Sect 1 Drop Leg Temp	-60 to +128	°C
O-55	Sect 1 Drop Leg Press	-3.4 - 180	Bar
O-57	Sect 1 Split	0 = Off, 1 = On	
O-59	Sect 1 Heat Reclaim	0 = Off, 1 = On	
O-61	Section 1 Night Set-back	0 = Off, 1 = On	
O-63	Section 1 Day Set-back	0 = Off, 1 = On	
O-70	Sect 1 Bypass	0 = Off, 1 = On	
S-01	Section 1 Control States	(0) Stabilise (1) Initial (2) Normal (3) High Pressure (4) Low Pressure (5) Low Shut-down (6) Transducer Fail (7) Stand-by	



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Quickview

Pressing the “quickview” button during normal operation displays the target pressure. If a two-stage controller has been configured, both target pressures are displayed on the corresponding Section display. Press the “quickview” button again to go back to the normal display or wait for the time-out period to elapse.

Override

The override function allows the user to switch output stages on or off. Press the override and enter button together for approx 3 seconds until “r-01” is displayed.

Use the “up” or “down” button to display the relays (r-01 to r-12) and 4 – 20mA outputs (A-01 and A-02)

For (r-01 to r-12) Press “Enter” and select “1” to turn the relay on and “0” to turn the relay off.

For (A-01 and A-02) Press “Enter” and use up and down buttons to select the output on 4-20mA outputs 1 and 2. Press the “Enter” button when the desired output percentage is reached. Each output can be set between 0% to 100%

Override will last for 30 seconds then the output will return to normal operation.

Info Button

When this button is used, Section 1 and Section 2 analogue output values can be displayed. When pressed the current analogue output percentage is shown on the corresponding Section display.

Standby Mode

Once in standby all configured stages are turned off and a standby alarm is generated for the given section. The delay applied before a section enters standby is determined by the General Alarm Delay (P-61). Once this delay expires the controller enters standby and a standby alarm is also generated for the relevant section.

Section 1 and Section 2 can be placed into standby independently using two separate status inputs or both sections can be placed into standby at the same time from a single status input. P494 determines the Standby configuration.

P494 set to 1 = On

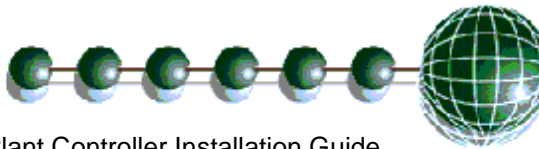
Controller uses one status input to place both sections into standby. Parameters P-80 to P-91 (Option 7 Std 1 N/O or Option 8 Std 1 N/C) are used to place both sections into standby from a single status input

P494 set 0 = Off

Controller uses two independent status inputs to place each section into standby independently. Controller uses P-80 to P-91 (Option 7 Std 1 N/O or 8 Std 1 N/C) to put section 1 into standby. Controller uses P-80 to P-91 (Option 9 Std 2 N/O or 10 Std 2 N/C) to put section 2 into standby



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Mercury Plant Controller Installation Guide

Probe Offsets

Each probe input, displayed as C-01 to C-08 from the controller display menu, can have an offset applied;

Up to $\pm 20^{\circ}\text{C}$ in increments of 0.1°C .

Display Messages

The following messages can appear on the display during normal operation.

Display	System status
HP	High Pressure alarm
LP	Low Pressure alarm
Ft TrAn	Pressure Transducer Fault
Ft	Fault
Sd	Low Pressure Shut-down
CP	Compressor Fault Compressor Run Fault
Cd	Condenser Fan Fault
gn	General Fault
Stby	Controller in Standby
Conf	Configuration / Set up error
triP	Discharge Pressure Trip alarm

Note 10: If Only 1 Transducer is fitted and the controller is set to a single section type, for example Pack, then Display 1 will show the current suction pressure but Display 2 will show Ft. Transducer input 2 is on by default to allow for the fitment of a transducer for monitoring purposes. If this probe is not fitted then set the parameter "Trans2 Span" to 0. This will clear the fault alarm.

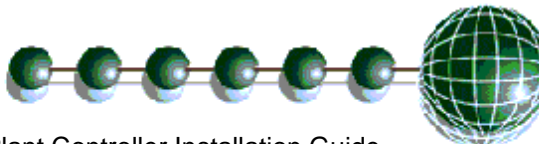
Network Alarms

The table below shows the text and associated type number that is sent to the system "front end". The type number is normally used to provide different alarm actions.

Alarm text	Type #
High Pressure Alarms	8
Low Pressure Alarms	9
Low Pressure Shutdown	10
Transducer Faults	6
General Faults	20
Compressor faults	3
Condenser Faults	3
Configuration fault	20
Controller in standby	20
INV Bypass	3
Liquid Level Fault	6
Liquid Level High	4
Liquid Level Low	5
Discharge Trip	20
Float Probe Fault	6
Drop Leg Probe Fault	6



Ensure that all power is
switched off before
installing or maintaining
this product



Mercury Plant Controller Installation Guide

Specification

Power requirements:

Supply Voltage Range:	24 Vac $\pm 10\%$ or 24 Vdc $\pm 10\%$
Supply Frequency:	50 – 60 Hz $\pm 10\%$
Maximum supply current:	<1 Amp
	Typical supply current: <1.0 Amp
Class 2 Insulation:	No protective Earth is required. A functional earth can be connected if the equipment is located in an electrically noisy environment.

**Note : The use of centre tapped to earth transformers is not allowed.
This is to prevent damage to the transformer and/or controller.**

The host equipment must provide adequate protection against contact to hazardous live parts.

RDM advise the use of a suitable external over-current protection device.

Warranty may be invalidated due to excess current being unlimited if there are no fuses/circuit breakers installed

General

Operating temperature range:	+5°C to +50°C
Operating Humidity:	80% maximum
Storage temperature range:	-20°C to +65°C
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 1, Installation Category II. Voltage fluctuations not to exceed $\pm 10\%$ of nominal voltage
Size:	270mm (L) x 115mm (W) x 50mm (H)
Weight:	700 Grams
Safety:	EN61010
EMC:	EN61326; 1997 + Amdt. A1; 1998
Ventilation:	There is no requirement for forced cooling ventilation

Inputs

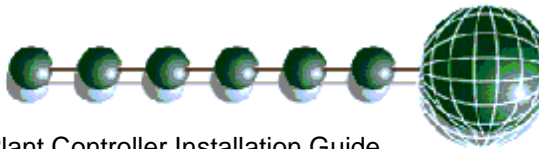
Probe Input type	See Set/change Units for probe types
Digital Input type	The preferred option is a 0 volt return through a volt free relay or 24 Vac referenced to the supply voltage. If a 24Vac signal is being sourced from the Plant controller power supply then do not ground the Digital Input common rail, this is grounded internally.
Comms:	Ethernet
4-20mA	4-20mA current loop, use the 12 Vdc output to feed the device.
Analogue Outputs	0 to 5/10 Volts dc or 0/4-20mA, Selected in the Front Panel Menu. A 50mA fuse is recommended for each Analogue output. The 4-20mA output will not operate correctly if the target device input impedance is $> 75\Omega$ The 0-10V output will not operate correctly if the target device input impedance is $< 10K\Omega$

Relay Ratings

All Relays	5A/250 Vac/AC1 (Resistive load) 5A/30 Vdc (Resistive) 2A/250 Vac $\cos\phi=0.3$ on N/O contact (Inductive Load)
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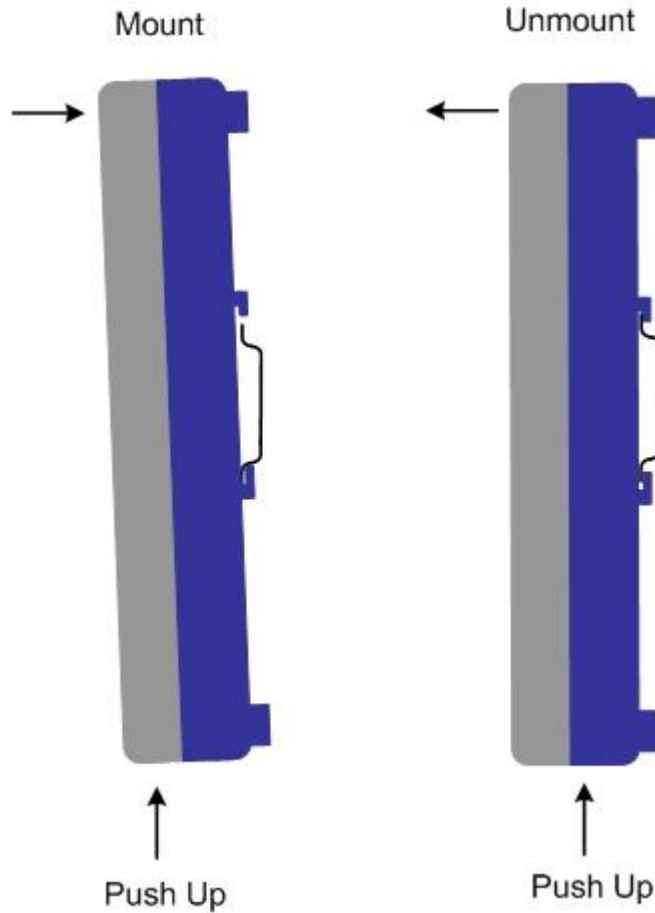


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Installation:

Mounting on to a DIN rail



Clearances:

The controller must have 10mm clearance above the top and 15mm clearance from the sides. Clearance at the front and rear is dependent on the site wiring. There is no requirement for forced cooling ventilation

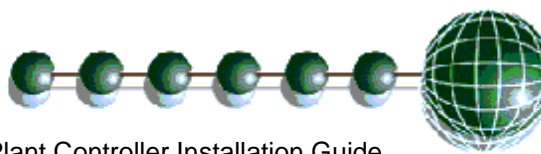
Cleaning:

Do not wet the controller when cleaning. Clean the front by wiping with a slightly dampened lint free cloth.

Please note: The specifications of the product detailed on this set up guide may change without notice. RDM Ltd shall not be liable for errors or for incidental or consequential damages, directly or indirectly, in connection with the furnishing, performance or misuse of this product or document.



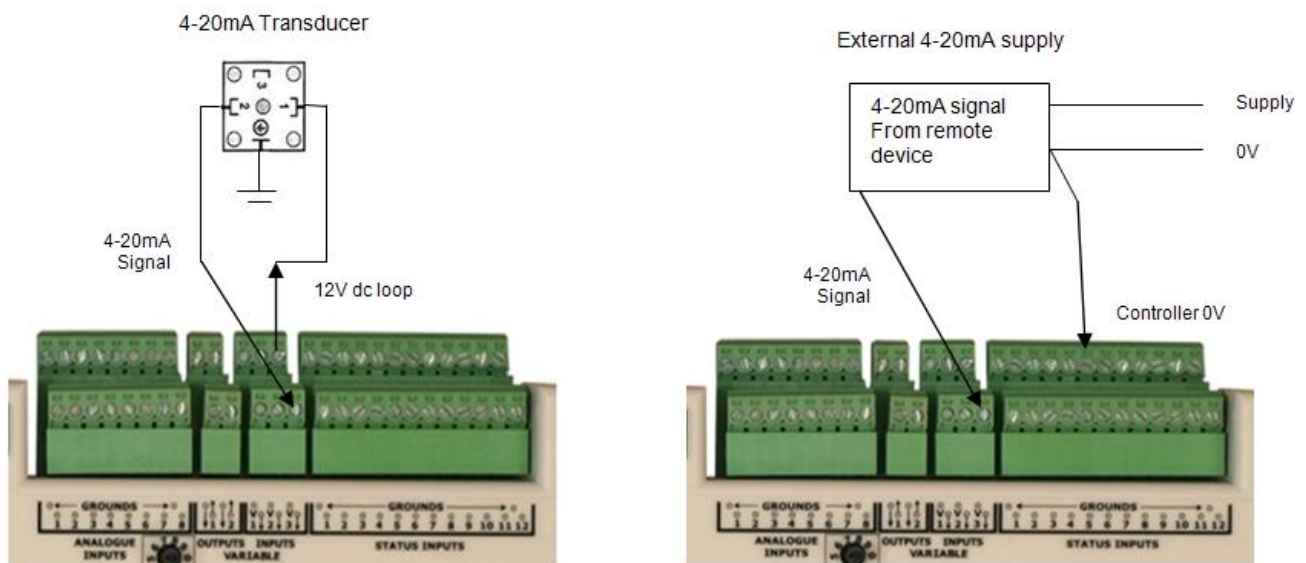
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Appendix 1 Typical Transducer Connection

For 4-20mA type transducers the diagram below shows the connections to the Plant Controller: -

Connection diagram for 4-20mA transducer with 12V dc loop and from a remote device

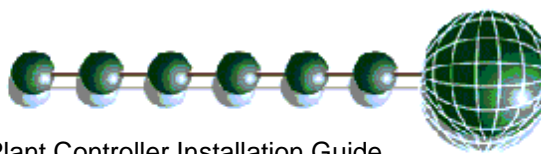


Section of controller showing Variable Inputs and controller 0V

Note: The Earth connection on the transducer is not necessary unless in an electrically noisy environment.



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Appendix 2 – Internal Analogue Modem Installation

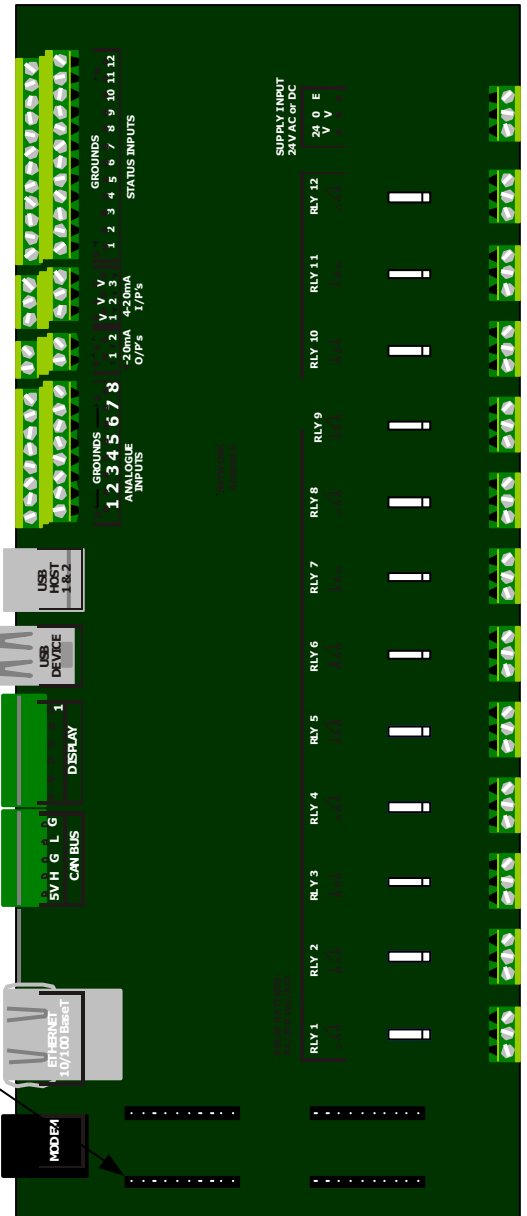
Before working on this equipment, ensure that the device is fully isolated from any supply voltage, including connections to all relays and other I/O connectors.

Installation of this part must be carried out by competent personnel.

RDM will not be held responsible for any damage incurred to the equipment through mishandling or faulty installation of this part.

Instructions

1. Align the Plant controller in a vertical position as shown and remove the plastic top cover. The four screws are accessed from the bottom of the controller.
2. Before removing the modem from its' packaging, make sure that you are static free. Insert the modem into it's' socket in the main printed circuit board, ensuring that the device is correctly orientated. Care must be taken when pushing the modem into its socket that all pins are correctly lined up and go neatly into their respective sockets.
3. The orientation when fitting the modem is as follows: Identify the corner of the PCB that has only two pins. The 2 pins fit into the bottom-left position.
4. Once the modem is satisfactorily positioned, re-assemble the Plant controller.



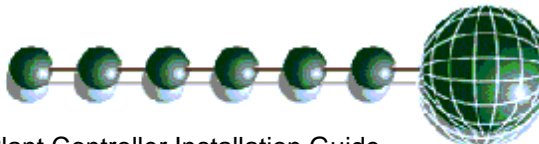
With the modem fitted it allows for remote access to the Plant controller only. There are no “dial out” alarm features available. This setup will allow for remote viewing of and changing of parameters.

Refer to the “Mercury Plant Controller PC Connection User Guide” on the RDM web site for instructions on how to set up a remote PC connection via the modem.

Note: the internal analogue modem feature is available with earlier versions of Plant controller hardware only.



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Appendix 3 – Supply & Status Input Wiring

Appendix three applies to earlier versions of the Plant controller hardware. Connection of the supply voltage and status inputs is important so that the internal bridge rectifier is not damaged. The diagram below shows possible methods of correctly wiring the supply and status inputs.

Method 1. Uses the 24Vac of the transformer supplying the input voltage; which is returned via a switch (or relay) to the status input signal line. No 0V is required at the status connector.

Method 2. Uses a 0V return (from the status connector) to the status signal input.

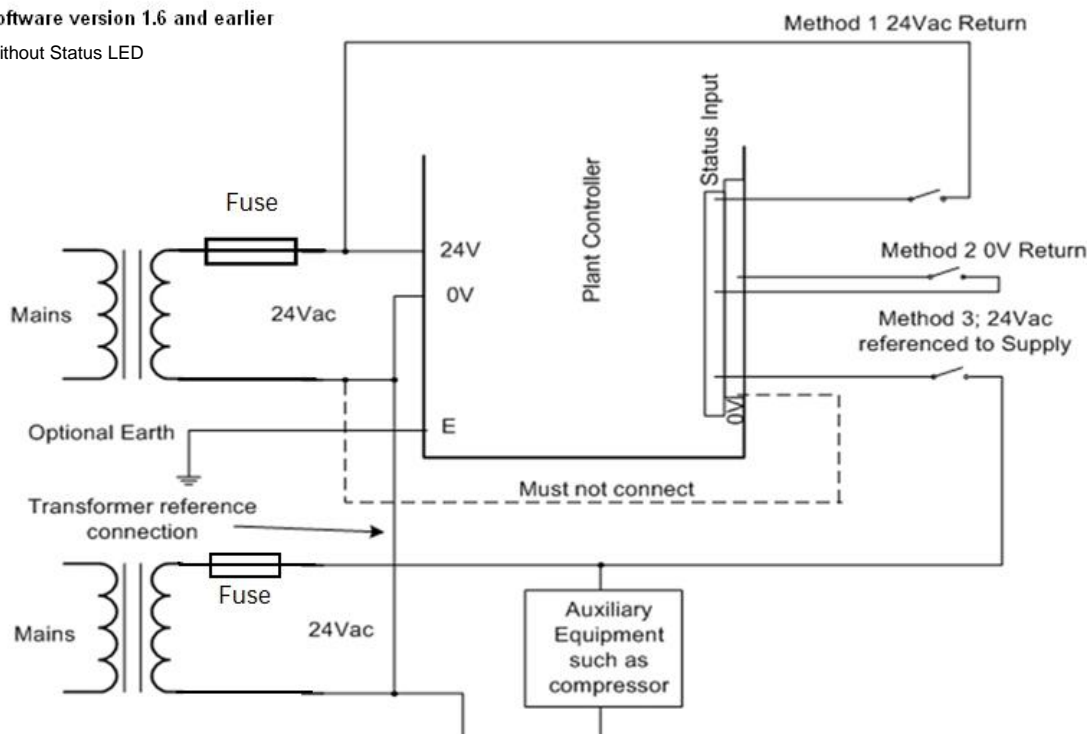
Method 3. Uses a 24Vac signal derived from another transformer (supplying an auxiliary piece of kit) to feed the status input signal line. Note the auxiliary transformer must be referenced to the Plant Controller supply transformer and that no 0v signal is required at the status input ground connection.

Ensure that there is no connection between the Plant controller Supply 0V and the Status input ground 0V; otherwise internal damage will occur.

All transformers that have a connection to the Plant Controller must have their primaries connected to the same phase. Transformer should have fuse fitted in line with 24V input as per diagram.

Software version 1.6 and earlier

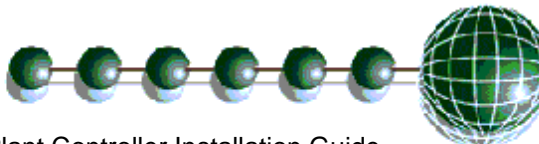
Without Status LED



The use of centre tapped to earth transformers is not allowed. This is to prevent damage to the transformer and/or controller.



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Appendix 4 – Supply & Status Input Wiring

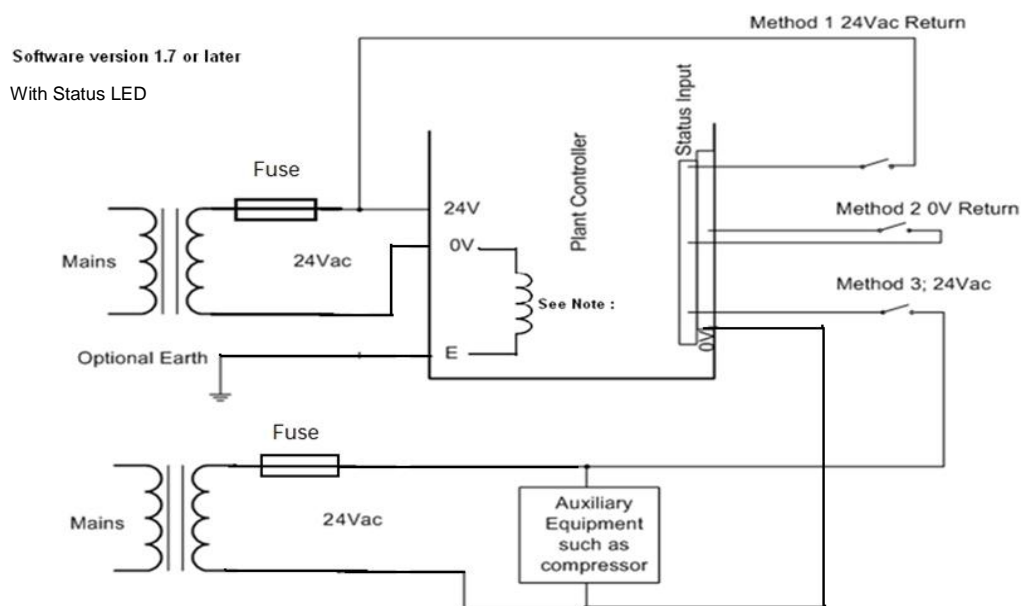
Appendix four applies to the current version of the Plant controller hardware.

Method 1. Uses the 24Vac of the transformer supplying the input voltage; which is returned via a switch (or relay) to the status input signal line. No 0V is required at the status connector.

Method 2. Uses a 0V return (from the status connector) to the status signal input.

Method 3. Uses a 24Vac signal derived from another transformer (supplying an auxiliary piece of kit) to feed the status input signal line. Note the auxiliary transformer must be referenced to the Plant Controller supply transformer.

All transformers that have a connection to the Plant Controller must have their primaries connected to the same phase. Transformer should have fuse fitted in line with 24V input as per diagram.

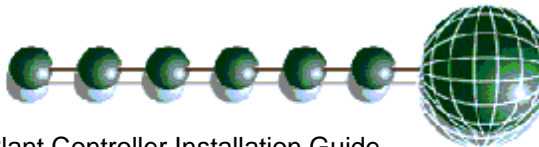


Note : New versions of hardware have 0V and Earth linked internally via an inductor. Recognisable by Status LED. See diagram on page 6 for location of status LED

The use of centre tapped to earth transformers is not allowed. This is to prevent damage to the transformer and/or controller.



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Revision History

Revision	Date	Changes
2.7	27/05/2011	Current Issue



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